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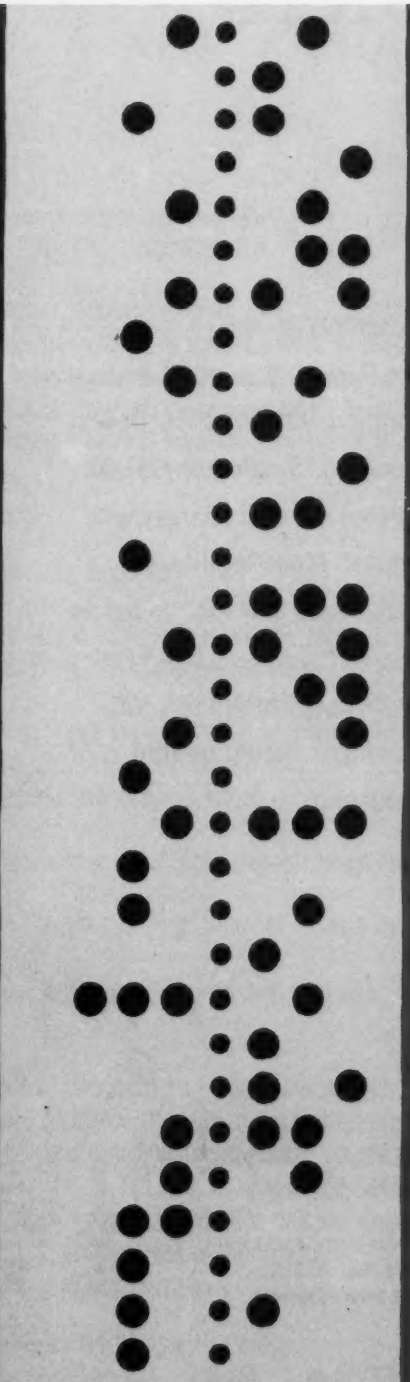

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U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

U.S. GOVERNMENT RESEARCH & DEVELOPMENT REPORTS

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ANNOUNCEMENTS IN SCIENCE AND TECHNOLOGY

ELECTRO-TECHNOLOGY

VULNERABILITY EFFECTS IN BULK-SOLIDS. VOLUME I.
Final rept. (Vol. 1), 1 Nov 66-30 Sep 67,
Cornell Univ Ithaca N Y School of Electrical Engineering
L. F. Eastman, L. A. MacKenzie, J. Baukus, J. Ballantyne, and R. E. Hayes. Jan 68, 92p
RADC-TR-67-646-Vol-I
Contract F30602-67-C-0075
See also Volume 2, AD-666 035, Volume no. 3, AD-666 036.

Descriptors: (*Semiconductor devices, *Electromagnetic compatibility), Microwave frequency, Indium antimonides, Gallium arsenides, Avalanche diodes, Harmonic generators, Carriers (Semiconductors), Cyclotron resonance phenomena, Signal-to-noise ratio, Thermal conductivity, Electrical properties, Noise (Radio), Doping, Mobility.
Identifiers: Helicons, Gunn effect.

Intrinsic characteristics of Gunn diodes, avalanche diodes, and bulk effects in magnetized InSb were studied for methods and techniques of enhancing electromagnetic compatibility in applications of these devices. Gunn domain mode oscillators were studied for their harmonic outputs and spectral content. 15 GHz oscillators were found to have high harmonic content even to the tenth harmonic, and heat sinking of the diodes was undertaken to allow measurements over a range of duty cycles up to continuous operation. Negative conductivity GaAs devices with low NeL (electron density-sample length) product in appropriate circuits were studied and linear amplification was obtained up to an efficiency of a few percent; thus, low ha[illegible] content is indicated. [illegible] nan[illegible]

CONFERENCE ON HIGH FREQUENCY GENERATION AND AMPLIFICATION, 29-31 AUGUST 1967.
Final technical rept.,
Cornell Univ Ithaca N Y School of Electrical Engineering
Herbert J. Carlin. 15 Feb 68, 97p
Grant Nonr (G)-00021-67
This conference is the first of a series of biennial conferences on Engineering Application of Electronic Phenomena.

Descriptors: (*Semiconductor devices, Microwave frequency), (*Solid state physics, Microwave frequency), Submillimeter waves, Parametric amplifiers, Space communication systems, Radar pulses, Tunnel diodes, Avalanche diodes, Varactor diodes, Transistors, Gas lasers, Cryogenics, Superconductivity, Electroluminescence, Photoconductivity, Carriers (Semiconductors), Magnetic fields, Doping, Bandwidth, Infrared radiation, Films, Carbon dioxide, Garnet, Ruby, Gallium arsenides, Zinc sulfides, Indium antimonides, Cadmium sulfides, Silicon, Germanium.
Identifiers: Gunn effect, Acoustoelectric effect, Quantum electronics, Q-switching.

The Conference on High Frequency Generation and Amplification is the first of a series of biennial conferences on Engineering Application of Electronic Phenomena to be offered by the School of Electrical Engineering, Cornell University. Nearly four hundred participants attended the sessions. Thirty nine scientific papers were presented. These papers encompassed fundamental physics of the Gunn effect, LSA mode, avalanche phenomena, surface recombination effects, acoustoelectric interactions in [illegible] and quantum electroni[illegible] of these

TWO-WAY RADIO COMMUNICATION MASS TRANSPORTATION DEMONSTRATION PROJECT.
Final rept.
New York City Transit Authority.
1968, 96p
Contract H-638

Descriptors: (*Railroads, *Radio communication systems), Transmitter-receivers, Feasibility studies, Voice communication systems, Radio equipment, Operators (Personnel), Police, Railroad cars, Statistical analysis, Mobile, Engineering, Tables, New York, Portable, Power supplies, Operation, Maintainability, Costs.
Identifiers: Rapid transit systems, New York City.

In its search for a better medium, this Authority specified two-way communication that would be equally effective in either direction and applicable to all of its activities. The train-to-wayside systems in Chicago, Toronto and London were too limited in scope for New York. A portable transistor radio, light enough to be carried, yet powerful enough to transmit and receive in the underground tunnels, was considered ideal. The development of miniaturized transistor components made this approach feasible, subject to the solution of technical problems. The purpose of the project was to demonstrate the effectiveness of such systems in

The radiation characteristic of the dominant beam mode of a lens-type beam waveguide is discussed; the assumption is made that this mode illuminates a circular aperture in a metallic screen. Radiation patterns are presented for various aperture radii and various distances between the aperture plane and the last lens of the guide. The exact field distribution of the [illegible] can be determined with[illegible] only at the [illegible]

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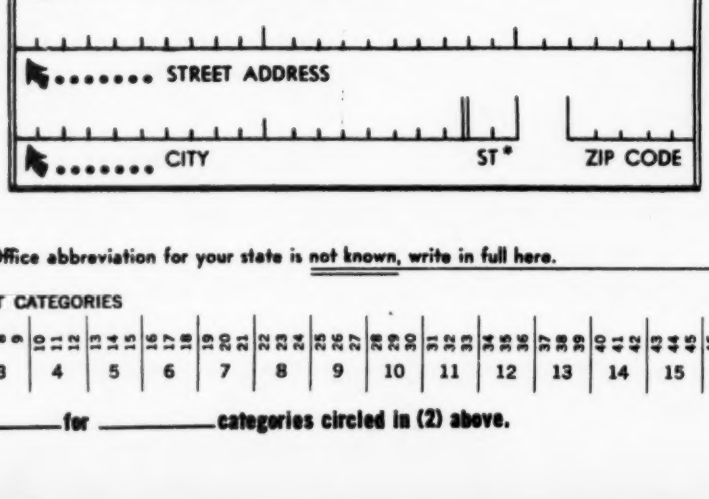

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(3) I have enclosed $_____ for _____ categories circled in (2) above.

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Circle the number(s) of your fields(s) of interest here and the corresponding smaller number(s) on the application on the last page of this notice.

1 **AERODYNAMICS AND FLUID MECHANICS**—Motion of gases at subsonic, transonic, supersonic and hypersonic speeds. Includes boundary-layer flow, compressible flow, gas and hydrodynamics.

2 **AERONAUTICS**—Design, production and maintenance of aircraft. Includes aircraft flight control systems, flight instruments and air facilities.

3 **AREA DEVELOPMENT PLANNING**—Environmental planning, state planning, metropolitan-urban planning and renewal, highway planning, public utilities, etc. Includes civil and structural engineering, construction equipment, materials and supplies, air and water pollution.

4 **ASTRONOMY AND ASTROPHYSICS**—Physical and chemical aspects of celestial bodies, their origin and evolution. Includes celestial mechanics.

5 **ATMOSPHERIC SCIENCES**—Physical and chemical properties of the atmosphere. Aeronomy, aurora and airglow, atmospheric structure, solar terrestrial relationships, meteorology-weather observations, predictions.

6 **AUTOMATION AND DATA PROCESSING**—Automatically controlled operation of an apparatus, process or system. Design, production and operation of data processing equipment and systems. Includes computers, input-output devices, computer software

7 **BEHAVIORAL SCIENCES**—Human factors engineering, man-machine relations, personnel selection and training, psychology.

8 **BIOLOGICAL SCIENCES**—Biochemistry, bioengineering, biology, bionics, environmental biology.

9 **CHEMISTRY AND CHEMICAL PROCESSING**—Organic, inorganic, physical and radiation chemistry. Plant equipment, apparatus, techniques, operations and processes that apply to chemical manuturing, processing, transportation and storage.

10 **COMMUNICATIONS**—Design, performance, operation and maintenance of telephone, telegraph, teletype, television and radio communication systems. Data transmission, telepathy, satellite communication.

11 **EARTH SCIENCES**—Cartography, geodesy, geography, geology and mineralogy, hydrology and limnology, mining engineering, seismology, soil mechanics, snow and permafrost, terrestrial magnetism.

12 **ECONOMICS**—Econometrics, economic history, economic theory, banking and finance, international economic relations, trade, commerce.

13 **ELECTRO-TECHNOLOGY** — Design, production, testing and performance of electronic and electrical equipment and materials. Micro-electronics, micro-miniaturization subsystems, transformers, generators, power transmission lines, high voltage research

14 **FOOD AND AGRICULTURE**—Preparation and processing, packaging, storage and dispensing of food. Kitchen equipment. Agricultural chemistry, economics and engineering. Agronomy and horticulture, animal husbandry.

15 **FUELS AND LUBRICANTS**—Production, testing, performance and storage of all types of solid, liquid or gaseous fuels, (excluding rocket propellants) lubricants.

16 **INDUSTRIAL ENGINEERING**—Industrial processes, airconditioning, heating, lighting, ventilating, containers and packaging.

17 **INFORMATION SCIENCES**—Library science. Acquisition, dissemination of recorded information, including printed matter, microforms, magnetic tapes and records. Cataloging, indexing, abstracting. Information storage and retrieval. Terminology dictionaries, thesauri. Machine translation and linguistics.

18 **MANAGEMENT PLANNING**—Administration and management, production planning, organization coordination, operations research, cost effectiveness, decision making.

19 **MARINE TECHNOLOGY**—Marine engineering—design, construction, maintenance, salvage, operation and performance of ships, boats, submarines, and marine equipment. Harbors, piers, docks, marine propulsion.

20 **MATERIALS**—Adhesives and seals, ceramics, refractories and glasses, coatings and finishes, composite materials, fibers and textiles, solvents, cleaners and abrasives.

21 **MATHEMATICS AND STATISTICS**—Mathematics and statistics research and applications.

22 **MECHANICAL ENGINEERING**—Machinery and tools; hydraulic and pneumatic equipment; couplings, fittings and fasteners; pumps, filters, pipes, valves.

23 **MEDICAL SCIENCES**—Clinical and industrial medicine, life support, pharmacology, physiology, toxicology, personal hygiene.

24 **METALS AND ALLOYS**—Refining and production of ferrous and non-ferrous metals and alloys. Includes extractive and physical metallurgy. Casting, forging, drawing, electroforming, extrusion, machining, rolling, stamping, spilling, powder and fiber metallurgy.

25 **MILITARY SCIENCES**—Military and civil defense, intelligence, logistics, operations and strategy, chemical, biological and radiological warfare.

26 **NAVIGATION AND DETECTION**—Navigation and guidance, direction finding, electromagnetic and acoustic countermeasures, acoustic, magnetic, optical, radar, seismic, infrared and ultraviolet detection.

27 **NUCLEAR SCIENCE**—Fusion devices, isotopes, nuclear explosions, nuclear instrumentation, radiation shielding, radioactive wastes, radioactivity.

28 **OCEANOGRAPHY**—Biological, physical and dynamic oceanography.

29 **OPERATIONS RESEARCH** — Theoretical operations research.

30 **OPTICS**—Generation, transmission reflection, refraction, propagation and properties of electromagnetic radiation in the infrared, visible and ultraviolet regions of the spectrum. Physical and geometric optics, electron optics, fiber optics. Optical imaging, optical equipment.

31 **ORDNANCE**—Theory, design, tests, production and operation of all types of missiles. Includes ammunition, bombs, guns, rockets, underwater ordnance, combat vehicles.

32 **PHYSICS (GENERAL)**—Acoustics, crystallography, electricity and magnetism, thermodynamics, wave propagation.

33 **PHYSICS (HIGH ENERGY)**—Particle accelerators, particle physics, quantum theory.

34 **PHYSICS (SOLID STATE)**—Structure and properties of solids. Includes masers, lascrs, semiconductors.

35 **PLASMA RESEARCH**—Theory and properties of plasmas, including magnetohydrodynamics, magneto-plasma, plasma oscillations, plasma sheaths, guns, jets, propulsion.

36 **PLASTICS AND ELASTOMERS**—Production, testing and properties of plastics, resins, reinforced plastics, laminates and elastomers. Includes copolymers, plastic foam, natural and synthetic rubber, rubber products.

37 **POWER SOURCE DEVICES**—Fuel cells, batteries, solar cells, thermionic converters, gas turbines. Rotary piston, stratified discharge and hybrid engines.

38 **PROPULSION SYSTEMS**—Air-breathing engines, jet and gas turbine engines, combustion and ignition, electric and nuclear propulsion, rocket motors and propellants.

39 **REACTOR TECHNOLOGY**—Reactor engineering and operation, reactor materials, reactor physics.

40 **REPROGRAPHY AND RECORDING DEVICES**—Photographic techniques and equipment. Cameras, lenses, shutters, projectors, photographic processes, photographic materials. Electrostatic reproduction, facsimile replication, photochromic replication. Printing, lithography, graphic arts.

41 **SAFETY ENGINEERING**—Accident prevention, safety devices, fire detection equipment, protective equipment.

42 **SOCIAL SCIENCES AND EDUCATION**—Humanities, sociology, history, law, political science.

43 **SPACE MECHANICS**—Determination, analysis, processing of spacecraft trajectory data, orbital calculations, reentry data.

44 **SPACE VEHICLES**—Theory, design, tests, production, operation, and maintenance of spacecraft, spacecraft components and supporting facilities. Includes astronautics, spacecraft, spacecraft launch vehicles, ground support.

45 **TESTING AND ANALYSIS**—Methodology and equipment related to testing and analysis. Includes design, operation and maintenance of laboratory and testing devices, simulation devices and facilities. X-ray diffraction, neutron diffraction, mass spectrometry, spectroscopy.

46 **TRANSPORTATION**—Design, operation and performance of passenger vehicles, cargo vehicles and railroad equipment. Includes air and water transportation.

U.S.GOVERNMENT RESEARCH & DEVELOPMENT REPORTS

Vol. 68, No. 14 July 25, 1968

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INDEXES. Subject, Personal Author, Corporate Author, Contract Number, and Accession/Report Number Indexes are published in the corresponding issue of U.S. GOVERNMENT RESEARCH & DEVELOPMENT REPORTS INDEX.

INTRODUCTION

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U.S. Government Research & Development Reports (USGRDR) is a semi-monthly abstract journal. *USGRDR* announces reports of U.S. Government-sponsored R&D released to the public through the Clearinghouse by the Atomic Energy Commission (AEC), Department of Defense (DoD), National Aeronautics & Space Administration (NASA), and other U.S. Government Departments and Agencies; U.S. Government-sponsored translations; and some foreign reports written in English. Most documents announced in *USGRDR* are for sale to the public at a nominal service charge.

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22 SUBJECT CATEGORIES

In the body of the journal, reports are announced in 22 subject categories called "Fields." Each Field is divided into subcategories called "Groups." The subject arrangement follows the *COSATI Subject Category List* (AD-612 200). An edge index on the back cover provides easy access to the Fields within the journal.

JOURNAL FORMAT

A typical entry includes the title (in bold face type), basic bibliographic information, descriptive terms, an abstract in most cases, the accession number, and price. Typical entries are shown on page iv.

No abstracts are given at this time for AEC and NASA reports, instead the reader is referred to the journal of original announcement—*Nuclear Science Abstracts (NSA)* or *Scientific & Technical Aerospace Reports (STAR)*. When machine conversion programs are complete, AEC and NASA abstracts will be included.

Descriptors and identifiers provide added subject definition. Descriptors considered of most value appear first in parentheses with their modifiers. Descriptors and open-end identifiers preceded by an asterisk are included in the subject index.

Reports covering more than one subject are announced in the primary field and cross-referenced to other fields.

A Locator List at the end of the journal gives the COSATI Field/Group location of each report cited in this issue.

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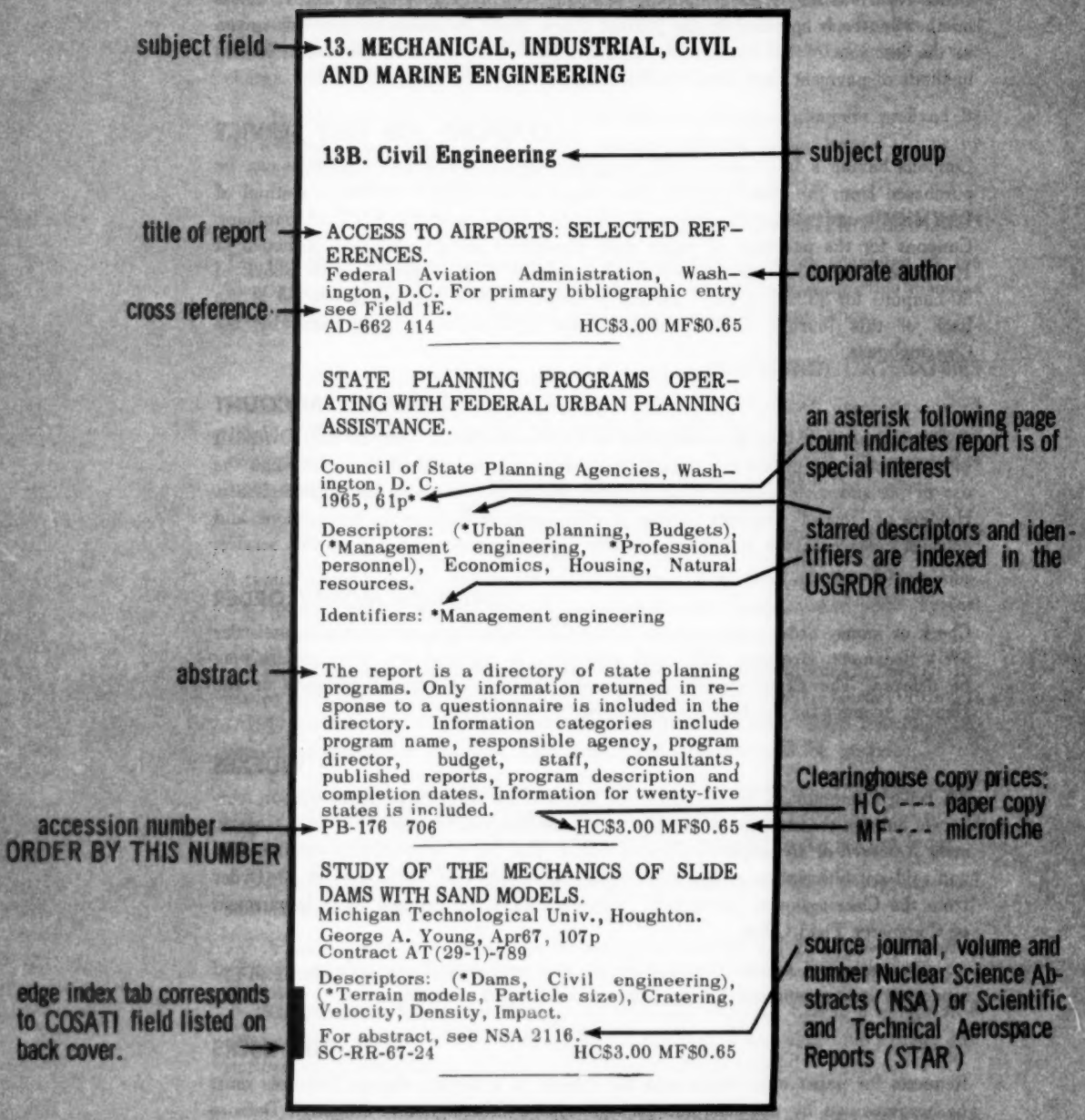
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13. MECHANICAL, INDUSTRIAL, CIVIL AND MARINE ENGINEERING
13B. Civil Engineering
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STATE PLANNING PROGRAMS OPERATING WITH FEDERAL URBAN PLANNING ASSISTANCE.
Council of State Planning Agencies, Washington, D. C.
1965, 61p*
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Descriptors: (*Urban planning, Budgets), (*Management engineering, *Professional personnel), Economics, Housing, Natural resources.
starred descriptors and identifiers are indexed in the USGRDR index
Identifiers: *Management engineering
abstract
The report is a directory of state planning programs. Only information returned in response to a questionnaire is included in the directory. Information categories include program name, responsible agency, program director, budget, staff, consultants, published reports, program description and completion dates. Information for twenty-five states is included.
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STUDY OF THE MECHANICS OF SLIDE DAMS WITH SAND MODELS.
Michigan Technological Univ., Houghton.
George A. Young, Apr67, 107p
Contract AT(29-1)-789
Descriptors: (*Dams, Civil engineering), (*Terrain models, Particle size), Cratering, Velocity, Density, Impact.
source journal, volume and number Nuclear Science Abstracts (NSA) or Scientific and Technical Aerospace Reports (STAR)
edge index tab corresponds to COSATI field listed on back cover.
For abstract, see NSA 2116.
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SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject Field in the journal)

FIELD 1. AERONAUTICS

Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE

Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS

Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES

Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES

Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES

Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY

Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY

Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING

Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive)

Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS

Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES

Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT

Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES

Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY

Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD. 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY

Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE

Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS

Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS

Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY

Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

R&D REPORTS AND TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

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American Meteorological Society Boston Mass
For primary bibliographic entry see Field 4A.
AD-669 163 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF THE WALL PRESSURE FLUCTUATIONS IN SUBSONIC SEPARATED FLOWS,
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 20D.
AD-669 214 HC$3.00 MF$0.65

TEST RESULTS FROM THE BOUNDARY LAYER FACILITY - RESPONSE OF STRUCTURE TO THE PSEUDO-SOUND FIELD OF A JET (USING COMBINED CONTINUUM AND FINITE ELEMENT METHOD),
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For primary bibliographic entry see Field 1C.
AD-669 215 HC$3.00 MF$0.65

TEST RESULTS FROM THE BOUNDARY LAYER FACILITY (THEORY AND EXPERIMENTAL COMPARISON),
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 217 HC$3.00 MF$0.65

ACOUSTIC SCALING BETWEEN MODEL COLD FLOW AND HOT FLOW JETS.
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 219 HC$3.00 MF$0.65

FLUID DYNAMICS OF ROTOR AND FAN SUPPORTED AIRCRAFT AT SUBSONIC SPEEDS.
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 1C.
AD-669 226 HC$3.00 MF$0.65

TECHNIQUES FOR MEASUREMENT OF DYNAMIC STABILITY DERIVATIVES IN GROUND TEST FACILITIES,
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 14B.
AD-669 227 HC$3.00 MF$0.65

INTERNAL LOW REYNOLDS NUMBER TURBULENT HEAT TRANSFER.
Arizona Univ Tucson Energy Mass and Momentum Transfer Lab
For primary bibliographic entry see Field 20D.
AD-669 254 HC$3.00 MF$0.65

CHARACTERISTICS OF THE DYNAMIC CALIBRATION OF AN INSTRUMENT FOR MEASURING THE INSTANTANEOUS TEMPERATURES OF GAS FLOWS (OSOBENNOSTI DINAMICHESKOI TARIROVKI APPARATURY DLYA IZMERENIYA MGNOVENNYKH TEMPERATUR GAZOVYKH POTOKOV),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 271 HC$3.00 MF$0.65

THEORY OF SHOCK WAVES AND INTRODUCTION TO GAS DYNAMICS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 272 HC$3.00 MF$0.65

JOURNAL OF ENGINEERING PHYSICS, VOL. 9, NO. 2, 1965 (SELECTED ARTICLES),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 312 HC$3.00 MF$0.65

BOUNDARY LAYER ON A CONTINUOUS MOVING PLANE SURFACE (O POGRANICHNOM SLOE NA DVIZHUSHCHEISYA NEPRERYVNOI PLOSKOI POVERKHNOSTI),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 313 HC$3.00 MF$0.65

PRESSURE DISTRIBUTION ON A CONE-CYLINDER-FLARE BODY AT MACH 14 IN THE PRESENCE OF FLOW SEPARATION.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 328 HC$3.00 MF$0.65

ENHANCEMENT OF HEAT AND MASS TRANSFER IN A STAGNATION REGION BY FREE STREAM VORTICITY,
Brown Univ Providence R I
For primary bibliographic entry see Field 20D.
AD-669 330 HC$3.00 MF$0.65

INTERACTION BETWEEN AIR FLOW AND AIRBORNE SOUND IN A DUCT: VOLUME II. ACOUSTIC EXCITATION OF BOUNDARY LAYER AND RADIATION IMPEDANCE OF ORIFICES.
Goettingen Univ (West Germany) Physikalisches Institut
For primary bibliographic entry see Field 20A.
AD-669 358 HC$3.00 MF$0.65

SUBSONIC OSCILLATORY OR STEADY AIRLOADS ON WINGS WITH CONTROL SURFACES AND OTHER DISCONTINUITIES.
Stanford Univ Calif Dept of Aeronautics and Astronautics
For primary bibliographic entry see Field 1C.
AD-669 373 HC$3.00 MF$0.65

STUDY OF THE BLUNT-BODY STAGNATION POINT VELOCITY GRADIENT IN HYPERSONIC FLOW,
Arnold Engineering Development Center Arnold Air Force Station Tenn
For primary bibliographic entry see Field 20D.
AD-669 378 HC$3.00 MF$0.65

GRAPHICAL METHODS IN AEROTHERMODYNAMICS,
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 20D.
AD-669 416 HC$3.00 MF$0.65

A CRITICAL REVIEW OF ANALYTICAL METHODS FOR ESTIMATING CONTROL FORCES PRODUCED BY SECONDARY INJECTION: THE TWO DIMENSIONAL PROBLEM,
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 21H.
AD-669 445 HC$3.00 MF$0.65

DEVELOPMENT OF A SUPERSONIC NOZZLE MOLECULAR BEAM FACILITY,
California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
For primary bibliographic entry see Field 14B.
AD-669 490 HC$3.00 MF$0.65

INVESTIGATION OF SHORT SUPERSONIC NOZZLES (ISSLEDOVANIE KOROTKIKH SVERKHZVUKOVYKH SOPEL),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 526 HC$3.00 MF$0.65

EFFECT ON HEAT EXCHANGE AND FRICTION OF COOLANT SUPPLY IN TURBULENT BOUNDARY LAYER (VLIYANIE NA TEPLOOBMEN I TRENIE PODACHI OKHLADITELEI V TURBULENTNYI POGRANICHNII SLOI),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20M.
AD-669 527 HC$3.00 MF$0.65

ON TURBULENT SHEAR FLOWS OF VARIABLE DENSITY,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 20D.
AD-669 563 HC$3.00 MF$0.65

DETERMINATION OF TRANSIENT GAS CONSTITUENT CONCENTRATIONS UTILIZING A HIGH ENERGY ELECTRON BEAM.
Arnold Engineering Development Center Arnold Air Force Station Tenn
For primary bibliographic entry see Field 14B.
AD-669 564 HC$3.00 MF$0.65

AN EMPIRICAL CORRELATION OF PRESSURE ON BLUNT-NOSED CYLINDRICAL AFTERBODIES AT HYPERSONIC MACH NUMBERS.
Arnold Engineering Development Center Arnold Air Force Station Tenn
For primary bibliographic entry see Field 20D.
AD-669 565 HC$3.00 MF$0.65

THE THIN LAYER APPROXIMATION IN HYPERSONIC VISCOUS FLOW THEORY.
General Research Corp Santa Barbara Calif
For primary bibliographic entry see Field 20D.
AD-669 571 HC$3.00 MF$0.65

VISCOUS, HYPERSONIC FLOW AROUND A BLUNT BODY.
Stanford Univ Calif Div of Engineering Mechanics
For primary bibliographic entry see Field 20D.
AD-669 578 HC$3.00 MF$0.65

A NUMERICAL SOLUTION FOR THE LAMINAR WAKE BEHIND A FINITE FLAT PLATE.
Stanford Univ Calif Div of Engineering Mechanics
For primary bibliographic entry see Field 20D.
AD-669 581 HC$3.00 MF$0.65

STUDIES OF NITRIC OXIDE CHEMILUMINESCENCE USING BOUNDARY LAYER APPROXIMATIONS.
Mithras Cambridge Mass
For primary bibliographic entry see Field 20D.
AD-669 582 HC$3.00 MF$0.65

CALCULATIONS OF EXPANDING SHOCK WAVES AND LATE-STAGE EQUIVALENCE.
Drexel Inst of Tech Philadelphia Pa
For primary bibliographic entry see Field 19D.
AD-669 645 HC$3.00 MF$0.65

Group 1A — Aerodynamics

TURBULENT SPECTRAL DATA IN LARGE-SCALE TURBULENT BOUNDARY LAYERS, DEVELOPED OVER DIFFERENT TYPES OF BOUNDARY ROUGHNESS.
Colorado State Univ Fort Collins Fluid Mechanics Program
For primary bibliographic entry see Field 20D.
AD-669 652 HC$3.00 MF$0.65

SURFACE RECOMBINATION EFFICIENCIES IN FLOWS CONTAINING STEP-FUNCTION INCREASES IN ATOMIC OXYGEN.
Cornell Aeronautical Lab Inc Buffalo N Y
For primary bibliographic entry see Field 7D.
AD-669 655 HC$3.00 MF$0.65

EVALUATION OF THE DUST CLOUD GENERATED BY HELICOPTER ROTOR DOWNWASH.
MSA Research Corp Evans City Pa
For primary bibliographic entry see Field 1C.
AD-669 676 HC$3.00 MF$0.65

NATURAL CONVECTION FROM HORIZONTAL RECTANGULAR CYLINDERS OF VARIOUS ASPECT RATIOS.
Catholic Univ of America Washington D C Dept of Mechanical Engineering
For primary bibliographic entry see Field 20M.
AD-669 694 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY-BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME I. USER'S MANUAL.
Final rept.,
Douglas Aircraft Co., Inc., Long Beach, Calif.
Arvel E. Gentry. Apr 68, 291p* DAC-56080-Vol-1
Contract F33615-67-C01008
Revision of report dated Mar 67. See also Volume 2, AD-817 159.

Descriptors: (*Hypersonic test vehicles, Hypersonic characteristics), (*Hypersonic planes, Hypersonic characteristics), (*Computer programs, Hypersonic characteristics), Aerodynamic configurations, Lifting reentry vehicles, Boost-glide vehicles, Wind tunnel models, Instruction manuals, Design, Three-dimensional flow.

A digital computer program system capable of determining the aerodynamic characteristics of complex hypersonic vehicle shapes is presented. This analysis system consists of four basic program components under the control of an executive main program. These components are the Aerodynamic Force Program, the Picture Drawing Program, the Output Data Plotter Program, and the Slab Delta Geometry Generation Program. Together, these components provide the necessary capabilities for performing all of the tasks required in the preliminary-design aerodynamic analyses of hypersonic shapes. The outstanding features of this system are its flexibility in covering a very wide variety of problems and the multitude of program options available. The program output is very comprehensive and includes all of the standard static aerodynamic coefficients, static - and dynamic - stability derivatives, and control surface characteristics and derivatives, including flow separation effects. Viscous forces are also calculated and include viscous-inviscid interaction effects. The geometric description techniques in this program provide the capability of handling completely arbitrary three-dimensional shapes. The procedure developed to check the accuracy of the geometric data uses a computer and automatic recorder to draw pictures of the vehicle viewed from any angle. Program output data are available in both printed and plotted form. (Author)
AD-817 158 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME II. PROGRAM FORMULATION AND LISTINGS.
Final rept.,
Douglas Aircraft Co., Inc., Long Beach, Calif.
Arvel E. Gentry. Apr 68, 559p* DAC-56080-Vol-2
Contract F33615-67-C-1008
Revision of report dated Mar 67. See also Volume 1, AD-817 158.

Descriptors: (*Hypersonic test vehicles, Hypersonic characteristics), (*Hypersonic planes, Hypersonic characteristics), (*Computer programs, Hypersonic characteristics), Aerodynamic configurations, Lifting reentry vehicles, Boost-glide vehicles, Wind tunnel models, Three-dimensional flow, Design, Subroutines.
AD-817 159 HC$3.00 MF$0.65

FLOW FIELD COMPUTATIONS FOR BLUNT BODIES IN PLANETARY ENVIRONMENTS (EQUILIBRIUM) FINAL REPORT.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Missile and Space Div.
C. V. Dohner, C. L. Kyriss, H. Rie, and C. J. Studerus. 28 Aug 67, 164p NASA-CR-94239, DOC.-67SD358
Contracts NAS7-100, JPL-951647
Prep- Prepared for Jpl

Descriptors: *Blunt bodies, *Conductive heat transfer, *Mars atmosphere, *Radiative heat transfer, Atmospheric entry, Carbon dioxide, Heat transfer coefficients, Hypersonic shock, Hypersonic speed, Nitrogen, Shock waves, Stagnation point, Stream functions (fluids).

For abstract, see STAR 06 12.
N68-21858 HC$3.00 MF$0.65

AN EXPERIMENTAL INVESTIGATION OF WALL INTERFERENCE EFFECTS ON DYNAMIC MEASUREMENTS ON HALF-MODELS IN VENTILATED TUNNELS THROUGH THE TRANSONIC SPEED RANGE.
National Physical Lab., Teddington (England). Aerodynamics Div.
A. W. Moore, and K. C. Wight. 3 Aug 67, 77p NPL-AERO-1243, ARC-29331

Descriptors: *Interference drag, *Oscillating flow, *Transonic speed, *Ventilation, *Wind tunnel walls, Delta wings, Mach number, Pitching moments, Scale models, Slotted wind tunnels, Subsonic speed, Supersonic speeds, Swept wings, Wall flow.

For abstract, see STAR 06 12.
N68-21903 HC$3.00 MF$0.65

DYNAMIC TESTS ON FREE-FLYING MODELS OF SLENDER WINGS SUBJECTED TO SIDE-GUSTS.
Aeronautical Research Council (Gt. Brit.)
For primary bibliographic entry see Field 1C.
For abstract, see STAR 06 12.
N68-21908 HC$3.00 MF$0.65

AERODYNAMIC CHARACTERISTICS IN PITCH OF A MODIFIED HALF RING WING BODY COMBINATION AND A SWEPT WING BODY COMBINATION AT MACH 2.16 TO 3.70.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
M. Lamb, and O. A. Morris. Apr 68, 40p NASA-TM-X-1551
Contract 126-13-02-08-23

Descriptors: *Pitch (inclination), *Wind tunnel stability tests, *Wing profiles, Aerodynamic characteristics, Body-wing and tail configurations, Interference lift, Lift drag ratio, Supersonic flow, Wind tunnel models, Wing planforms.

For abstract, see STAR 06 12.
N68-21940 HC$3.00 MF$0.65

A METHOD FOR PREDICTING SHOCK SHAPES AND PRESSURE DISTRIBUTIONS FOR A WIDE VARIETY OF BLUNT BODIES AT ZERO ANGLE OF ATTACK.
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
G. E. Kaattari. Apr 68, 41p NASA-TN-D-4539
Contract 129-01-08-01-00-21

Descriptors: *Blunt bodies, *Bow waves, *Shock waves, Atmospheric entry, Correlation coefficients, Flow geometry, Pressure distribution, Reentry physics, Shock wave propagation, Stagnation point, Subsonic flow.

For abstract, see STAR 06 12.
N68-21941 HC$3.00 MF$0.65

ANALYTICAL AND EXPERIMENTAL STUDY OF DYNAMIC CHARACTERISTICS OF TURBOPUMPS.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
For primary bibliographic entry see Field 13K.
For abstract, see STAR 06 12.
N68-21950 HC$3.00 MF$0.65

EFFECTS OF SIMULATED WING DAMAGE ON THE AERODYNAMIC CHARACTERISTICS OF A SWEPT-WING AIRPLANE MODEL.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 1C.
For abstract, see STAR 06 12.
N68-22002 HC$3.00 MF$0.65

INCIDENCE AND LEADING EDGE EFFECTS ON FLOW AROUND A FLAT PLATE AT MACH NUMBER 18.
Effets D'incidence Et de Bord D'attaque Sur l'Ecoulement Autour D'une Plaque Plane A Un Nombre de Mach de 18
Centre National de La Recherche Scientifique, Meudon (France). Laboratoire D'aerothermique.
J. Allegre, and C. Bisch. Dec 67, 32p REPT.-67-10
Lang- in French

Descriptors: *Flat plates, *Hypervelocity wind tunnels, *Incidence, *Partial pressure, Flow visualization, Leading edges, Pitot tubes, Shock waves.

For abstract, see STAR 06 12.
N68-22012 HC$3.00

CHEMICAL SPECIES AND CHEMICAL REACTIONS OF IMPORTANCE IN NONEQUILIBRIUM PERFORMANCE CALCULATIONS.
TRW Systems, Redondo Beach, Calif.
P. I. Gold, and C. T. Weekley. 6 Dec 66, 76p NASA-CR-92057, TRW-02874-6001-R000
Contract NAS9-4358

Descriptors: *Computer programs, *Nonequilibrium flow, *Nozzle flow, Axisymmetric flow, Chemical reactions, Flow distribution, Inviscid flow, One dimensional flow.

For abstract, see STAR 06 12.
N68-22014 HC$3.00 MF$0.65

MASS TRANSFER ON A CYLINDRICAL-CONICAL OBSTACLE.
Transfert de Masse Sur Un Obstacle Cylindro-conique
Centre National de La Recherche Scientifique, Meudon (France). Laboratoire D'aerothermique.
G. B. Diep. Dec 67, 26p REPT.-67-8
Lang- in French

Descriptors: *Cones, *Mass transfer, *Turbulence effects, Incidence, Polymethyl methacrylate, Pressure gradients, Subsonic wind tunnels, Two dimensional flow.

For abstract, see STAR 06 12.
N68-22058 HC$3.00

AN ANALYTICAL STUDY OF THE MEASURED WALL PRESSURE FIELD UNDER SUPERSONIC TURBULENT BOUNDARY LAYERS.
Tracor, Inc., Rockville, Md.
T. J. Black. Apr 68, 167p NASA-CR-888, TRACOR-RL/67-070-U
Contract NAS1-6952
Coll- 167 P Refs

Descriptors: *Shear layers, *Supersonic flow, *Turbulence effects, *Vortex generators, *Wall pressure, Pressure distribution, Scaling laws, Shear stress, Turbulent flow.

For abstract, see STAR 06 12.
N68-22087 HC$3.00 MF$0.65

EFFECTS OF SHOCK IMPINGEMENT AND OTHER FACTORS ON LEADING-EDGE HEAT TRANSFER.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 20M.
For abstract, see STAR 06 12.
N68-22118 HC$3.00 MF$0.65

HYPERVELOCITY HEAT TRANSFER STUDIES IN SIMULATED PLANETARY ATMOSPHERES, APPENDIX FINAL REPORT.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Sciences Lab.
Jun 67, 144p NASA-CR-94316
Contracts NAS7-100, JPL-950297
Prep- Prepared for Jpl

Descriptors: *Gas dynamics, *Gas mixtures, *Shock tubes, *Shock waves, Graphs (charts), Hypersonic flow, Incidence, Particle density (concentration), Planetary atmospheres, Thermodynamic properties.

For abstract, see STAR 06 12.
N68-22229 HC$3.00 MF$0.65

FORMULATION OF A METHOD FOR PREDICTING COUPLED CONVECTIVE AND RADIATIVE HEAT TRANSFER ABOUT A BLUNT BODY.
Lockheed Missiles and Space Co., Huntsville, Ala.
For primary bibliographic entry see Field 20M.
For abstract, see STAR 06 12.
N68-22403 HC$3.00 MF$0.65

INVISCID FLOW FIELD INDUCED BY A ROTOR IN GROUND EFFECT.
Therm Advanced Research, Inc., Ithaca, N. Y.
M. D. Greenberg, and A. L. Kaskel. May 68, 54p NASA-CR-1027
Contract NAS1-6349
Coll- 54 P Refs

Descriptors: *Ground effect, *Integral equations, *Inviscid flow, *Lifting rotors, Downwash, Flow distribution, Impingement, Iterative solution.

For abstract, see STAR 06 12.
N68-22475 HC$3.00

THE DRAG OF SOME WEDGE CENTRE-BODY INTAKES AT MACH NUMBERS OF 1.56, 1.86 AND 2.14.
Aeronautical Research Council (Gt. Brit.)
R. A. Dutton, and E. L. Goldsmith. 1967, 69p ARC-CP-968, RAE-TR-66208

Descriptors: *Aerodynamic drag, *Centerbodies, *Drag measurement, *Supersonic inlets, *Wedge flow, Ducted bodies, Inlet flow, Inlet pressure, Mass flow, Pressure recovery.

For abstract, see STAR 06 12.
N68-22651 HC$3.00 MF$0.65

MEASUREMENTS OF SKIN FRICTION ON A CAMBERED DELTA WING AT SUPERSONIC SPEEDS.
Aeronautical Research Council (Gt. Brit.)
K. G. Smith, and K. G. Winter. 1967, 45p ARC-R+M-3501, RAE-TR-65181

Descriptors: *Aerodynamic drag, *Delta wings, *Friction drag, *Supersonic drag, *Wing flow method tests, Boundary layers, Cambered wings, Drag measurement, Pressure gradients.

For abstract, see STAR 06 12.
N68-22652 HC$3.00 MF$0.65

SIMILARITY STUDIES ON THE RADIATIVE GAS DYNAMIC EQUATIONS.
Case Inst. of Tech., Cleveland, Ohio.
J. N. Castro. 1968, 151p NASA-CR-94409, A-47
Grant NSG-198

Descriptors: *Gas dynamics, *Shock wave propagation, Approximation, Detonation waves, Flow equations, Gas flow, Operators (mathematics), Problem solving, Radiative heat transfer, Shock waves, Similarity theorem, Symmetry, Transport properties.

For abstract, see STAR 06 12.
N68-22711 HC$3.00 MF$0.65

COMPENDIUM OF SHOCK WAVE DATA,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 19D.
For abstract, see NSA 22 10.
UCRL-50108-Vol-1-Suppl-1 HC$3.00 MF$0.65

COMPENDIUM OF SHOCK WAVE DATA,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 19D.
For abstract, see NSA 22 10.
UCRL-50108-Vol-2-Suppl-1 HC$3.00 MF$0.65

1B. Aeronautics

PSYCHOPHYSIOLOGICAL FEATURES OF FLIGHT OVER WATER (PSIKHOFIZIOLOGICHESKIE OSOBENNOSTI POLETA NAD MOREM),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 5I.
AD-669 269 HC$3.00 MF$0.65

AIR TRANSPORT HISTORY AND A GLIMPSE INTO THE FUTURE,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 1C.
AD-669 340 HC$3.00 MF$0.65

COMPARATIVE STUDY OF BODY DISPLACEMENTS IN BOTH HUMANS AND ANTHROPOMORPHIC DUMMIES WHEN SIMULTANEOUSLY SUBJECTED TO CONTROLLED VERTICAL IMPACT TYPE DECELERATIONS.
Naval Air Development Center Johnsville Pa Aerospace Crew Equipment Dept
For primary bibliographic entry see Field 5E.
AD-669 466 HC$3.00 MF$0.65

AIRCRAFT PENNANT INVESTIGATION,
Aeroplane and Armament Experimental Establishment Boscombe Down (England)
For primary bibliographic entry see Field 1C.
AD-669 675 HC$3.00 MF$0.65

A SIMULATOR INVESTIGATION OF THE PROBLEM OF VISUAL TAXI-GUIDANCE IN LOW VISIBILITIES.
Royal Aircraft Establishment, Farnborough (England).
L. Betts, A. D. Brown, and N. J. Jeffs. Aug 67, 51p CRAE-TR-67170

Descriptors: *Aircraft guidance, *Flight simulation, *Low visibility, *Taxiing, Aircraft landing, Airfield surface movements, Approach indicators, Optical tracking, Pilot performance, Visual control.

For abstract, see STAR 06 12.
N68-21987 HC$3.00 MF$0.65

RUNWAY GROOVING FOR INCREASING TIRE TRACTION - THE CURRENT PROGRAM AND AN ASSESSMENT OF AVAILABLE RESULTS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 1E.
For abstract, see STAR 06 12.
N68-22063 HC$3.00 MF$0.65

1C. Aircraft

THE ROLE OF PROJECT HISTORIES IN THE STUDY OF R AND D,
RAND Corp., Santa Monica, Calif.
For primary bibliographic entry see Field 5B.
AD-458 062 HC$3.00

POSSIBILITIES AND DEVICES FOR THE SUPPRESSION OF JET NOISE,
Boeing Co Renton Wash Airplane Div
Edvard Grande. 1968, 48p Rept no. D6-20609

Descriptors: (*Jet engine noise, Inhibition), Exhaust gases, Velocity, Design, Supersonic planes, Supersonic characteristics, Nozzle gas flow, Jet mixing flow, Turbofan engines, Turbojet exhaust nozzles.
Identifiers: *Noise suppressors.

The paper discusses the present state of the development of techniques for the suppression of jet noise. The theoretical models on jet noise are mentioned briefly, and the 'design principles' for jet noise suppressors are discussed in detail. In defining the generation of jet noise, the following three separate velocity regimes are considered: (low speed jets), (moderate speed jets), and (high speed jets). The discussion on jet noise suppression considers each velocity regime separately, taking into account the extensive overlap between the regimes. (Author)
AD-669 210 HC$3.00 MF$0.65

TEST RESULTS FROM THE BOUNDARY LAYER FACILITY - RESPONSE OF STRUCTURE TO THE PSEUDO-SOUND FIELD OF A JET (USING COMBINED CONTINUUM AND FINITE ELEMENT METHOD),
Boeing Co Renton Wash Commercial Airplane Div
L. Maestrello. 2 Jan 68, 49p Rept no. D6-9944-Vol-4
See also Volume 3, AD-669 217.

Descriptors: (*Airplane panels, *Aerodynamic loading), Jets, Wake, Sound, Acoustic properties, Response, Boundary layer, Continuum mechanics, Pressure, Sonic fatigue, Vibration, Mathematical prediction, Airframes.

The response of a simple panel structure to a jet pseudo-sound field is investigated and a prediction

method is presented. The mean square displacement is approximated quite closely but the modal energy distribution is shown to be more dependent on an accurate pressure field model being assumed. It is argued however, that the accuracy of the prediction method can only improve with increasing jet diameter, with the result that a full-scale situation would be more favorable to this combined method. The use of a finite element technique enables complex structures to be represented more realistically than with the normal mode assumption, although the latter is sufficient at the higher mode numbers, and probably more accurate. (Author)
AD-669 215 HC$3.00 MF$0.65

TEST RESULTS FROM THE BOUNDARY LAYER FACILITY (THEORY AND EXPERIMENTAL COMPARISON),
Boeing Co Renton Wash Commercial Airplane Div
L. Maestrello. 11 May 66, 88p Rept no. D6-9944-Vol-3
See also Volume 4, AD-669 215.

Descriptors: (*Airplane panels, Aerodynamic loading), Acoustic properties, Pressure, Turbulent boundary layer, Correlation techniques, Walls, Response, Aerodynamic noise, Vibration, Power spectra, Wind tunnel models, Theory, Sonic fatigue.
Identifiers: Skin (Structural).

The problem of acoustic radiation of panels excited by random pressure fluctuation of the turbulent boundary layer was investigated. The main purpose of the paper is to show by using a relatively simple functional representation of the space-time correlation of the wall pressure fluctuation, and by the use of Lyons-Dyer method, that motion and radiation intensity of a simply-supported panel agree reasonably well with experimental results. The most striking feature of the excitation mechanism is the so-called coincidence which has profound effects on the response of the structure and power radiations. If, under certain conditions, a mismatch occurs between wave speeds on the panel and the pressure field, panel displacement and acoustic radiation should be reduced. Such a mismatch is caused by a turbulence pressure eddy which decays faster than the mode's wavelength on the structure. (Author)
AD-669 217 HC$3.00 MF$0.65

ACOUSTIC SCALING BETWEEN MODEL COLD FLOW AND HOT FLOW JETS.
Technical note,
Boeing Co Renton Wash Commercial Airplane Div
E. Grande. 30 Aug 67, 54p Rept no. D6-20601-TN

Descriptors: (*Jet engine noise, Inhibition), Cold flow tests, Aerodynamic noise, Model tests, Acoustic properties, Thermodynamics, Jets, Exhaust nozzles, Jet pumps, Power spectra.
Identifiers: Noise suppressors.

The report presents acoustic far field data on a simple conical jet. The temperature of the jet flow is varied from ambient to 2600F in a range of Mach numbers from 0.4 to 2.0. The data are evaluated with the purpose of obtaining parameters for acoustic scaling between hot and cold flow model jets. The analysis is divided into three main phases which consider the following aspects of scaling: (1) Scaling between hot and cold jet noise spectra, (2) Total acoustic power scaling between hot and cold flow jets, and (3) The directivity of noise emission of hot and cold jets. (Author)
AD-669 219 HC$3.00 MF$0.65

FLUID DYNAMICS OF ROTOR AND FAN SUPPORTED AIRCRAFT AT SUBSONIC SPEEDS.
Conference proceedings.
Advisory Group for Aerospace Research and Development Paris (France)
Sep 67, 597p Rept no. AGARD-CP-22
NATO furnished. Presented at a Specialists' Meeting of the Fluid Dynamics Panel of AGARD, Goettingen (Germany) 11-13 Sep 67.

Descriptors: (*Vertical take-off planes, Symposia), Helicopters, Helicopter rotors, Rotary wings, Aerodynamic characteristics, Wind tunnel models, Model tests, Fans, Aeroelasticity, Jets, Lift, Deflection, Propellers (Aerial), Airplane noise, Vortices, Short take-off planes.
Identifiers: Stowed rotor aircraft, Cross flow, Lift fans, Transition flight.

The collection of papers emphasizes the following areas: rotors and fans in hover and transition, interference with the airframe and the ground, ground effects on rotors and fans, noise problems and testing techniques. The topics are based on low-discloading devices. (Author)
AD-669 226 HC$3.00 MF$0.65

THE AIRCRAFT INTEGRATED DATA SYSTEM, ACIDS.
Final rept.,
Parks Coll of Aeronautical Technology East St Louis Ill
J. F. Harrington, J. W. Bryer, J. A. George, R. R. Shank, and D. W. Carter. Jun 68, 246p*
USAAVCOM-TR-68-1
Contract DAAJ01-67-C-0733

Descriptors: (*Helicopters, *Warning systems), Malfunctions, Sensors, Recording systems, Maintenance, Data processing systems, Automatic, Systems engineering, Cost effectiveness, Feasibility studies, Identification systems, Commercial planes, Magnetic tape.
Identifiers: UH-1D aircraft, H-1 aircraft, ACIDS (Aircraft Integrated Data System), Aircraft integrated data systems.

The report constitutes a systems engineering study for the design of a system which can, by means of a tape recording of the history of performance and condition of respective dynamic components, make deterministic predictions of the operational life of the components so measured and provide a capability for detection and diagnosis of malfunctions. In addition, the system will provide data for prediction of on-condition removal, for fleet analysis, for determination of usage rates, and data which should be used as the predicate for the prediction of future parts and spares requirements. The study includes consideration of the parameters to be monitored, the hardware concept to implement the system, the mathematical models for data analysis, the software requirements, and the management aspects. The primary finding made is that the proposed system (ACIDS) for the UH-1D is feasible, practical, and economical. (Author)
AD-669 262 HC$3.00 MF$0.65

SIMULATION TECHNIQUES FOR ANALYZING AIR COMBAT SYSTEMS,
Rand Corp Santa Monica Calif
Terrell E. Greene, and John H. Huntzicker. May 68, 21p Rept no. P-3818

Descriptors: (*Jet fighters, Design), (*Aerial warfare, Mathematical models), Computer programs, Simulation, Maneuverability, Ranges (Distance), Thrust, Weight, Loading (Mechanics), Optimization, Guided missiles (Air-to-air).
Identifiers: Tradeoffs.

Like any other aircraft, an air-to-air fighter is the result of a series of design compromises. The design features that typically are involved in the compromises on fighters, however, are peculiar to this type of aircraft. For air-to-air fighters, the most significant compromises tend to be between range, on the one hand, and a set of design and performance factors, on the other, that may be grouped under the term 'system agility.' The digital computer simulation model for analysis of air combat systems is called the TACTICS model. It is designed for primary use as a research tool in studies of preferred air combat system design; for this reason, emphasis in the model is on an analytical description of the processes of air duels rather than on computing expected or probabilistic outcomes.
AD-669 318 HC$3.00 MF$0.65

PRESSURE DISTRIBUTION ON A CONE-CYLINDER-FLARE BODY AT MACH 14 IN THE PRESENCE OF FLOW SEPARATION.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 328 HC$3.00 MF$0.65

AIR TRANSPORT HISTORY AND A GLIMPSE INTO THE FUTURE,
Rand Corp Santa Monica Calif
Arthur E. Raymond. May 68, 31p Rept no. P-3849
Presented at the Annual Lester D. Gardner Lecture (9th), Cambridge, Mass. 2 May 68.

Descriptors: (*Transport planes, Reviews), (*Air transportation, History), Commercial planes, Design, Jet transport planes, Supersonic planes, Short take-off planes, Predictions.

A general discussion is presented of some of the older aircraft, especially Douglas aircraft; and some of the more recent advances in aviation technology are reviewed.
AD-669 340 HC$3.00 MF$0.65

ESTIMATES OF AIRCRAFT CHARACTERISTICS WITH SOME IMPLICATIONS FOR COST ANALYSIS,
Rand Corp Santa Monica Calif
Donald M. Fisk. Apr 68, 21p Rept no. P-3836
Presented to the Annual DOD Cost Research Symposium (3rd), March 13-5 1968.

Descriptors: (*Aircraft, *Costs), Velocity, Takeoff, Weight, Thrust, Cost effectiveness, Mathematical prediction, Errors, Statistical analysis.
Identifiers: Cost analysis.

Three characteristics are considered: maximum speed, gross takeoff weight, and maximum thrust. The discussion is divided into three parts: errors in estimates, impact of these errors on cost analysis, and implications and suggestions. (Author)
AD-669 341 HC$3.00 MF$0.65

A TUBE WIND TUNNEL FOR HIGH REYNOLDS NUMBER SUPERSONIC TESTING,
Cornell Aeronautical Lab Inc Buffalo N Y
For primary bibliographic entry see Field 14B.
AD-669 353 HC$3.00 MF$0.65

SUBSONIC OSCILLATORY OR STEADY AIRLOADS ON WINGS WITH CONTROL SURFACES AND OTHER DISCONTINUITIES.
Scientific Interim rept.,
Stanford Univ Calif Dept of Aeronautics and Astronautics
Holt Ashley. Dec 67, 56p Rept no. SUDAAR-336
AFOSR-68-0419
Contract F44620-67-C-0044

Descriptors: (*Aerodynamic control surfaces, *Aerodynamic loading), Subsonic characteristics, Oscillation, Wings, Numerical analysis, Integral equations, Pressure, Distribution, Lift, Trailing edge, Leading edge, Flaps, Aeroelasticity.
Identifiers: Pressure distribution, Unsteady flow, Upwash.

Detailed procedures are described for numerical calculation of the lifting pressure distribution on a wing or tail with control surfaces or other discontinuities, oscillating in a subsonic main stream. The basis of the solution is the integral equation of a pressure doublet sheet, linearized under the hypothesis of small disturbances. The key discovery

permitting a new approach to this problem is Landahl's theorem, which shows that the magnitude of the pressure singularity along a discontinuity line such as a control leading or side edge is directly related to the upwash discontinuity at that edge. Two known exact solutions are shown to verify Landahl's result. The report focuses on symmetrical motion of a pair of symmetrically-disposed trailing-edge controls with rectilinear, swept leading edges. The extensions to other cases, such as antisymmetrical motion, leading-edge flaps, controls with aerodynamic balance, etc., are discussed. Brief illustrations are presented on the use of matched asymptotic expansions in other discontinuity situations which may arise in lifting surface theory. (Author)
AD-669 373 HC$3.00 MF$0.65

AIR CRAFT LANDING GEAR BRAKE FRICTION MATERIALS DEVELOPMENT.
Final rept. 28 May 52-31 Jul 57,
Armour Research Foundation Chicago Ill
M. Eisenberg, E. Flint, H. B. Nudelman, S. W. McGee, and G. Carlson. 31 Jul 57, 201p
Contract AF 33 (616)-186

Descriptors: (*Landing gear, Brakes), (*Brakes, Materials), State-of-the-art reviews, Reinforcing materials, Titanium alloys, Molybdenum alloys, Vanadium alloys, Titanium, Molybdenum, Ceramic materials, Friction, Wear resistance, Composite materials.
Identifiers: Brake linings, Landing gear brakes.

The objective of this program was to survey the literature on the subject, the aircraft brake industry, and then to develop new improved brake linings and mating member alloys able to sustain high energy stop conditions. Titanium and molybdenum reinforced linings were found to be very promising and are recommended for further development. The alloys capable of withstanding severe braking conditions were 30% molybdenum-70% titanium and 50% titanium-50% vanadium. Molybdenum also showed promise as being very valuable in future brake development either alone or alloyed. Metal fiber reinforcement of metal-ceramic linings contributed considerably to the strength of the new materials. (Author)
AD-669 388 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. I. SUMMARY OF THE STUDY.
American Institutes for Research Pittsburgh Pa
For primary bibliographic entry see Field 5I.
AD-669 397 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. II. IDENTIFICATION OF TRAINING CONTENT.
American Institutes for Research Pittsburgh Pa
For primary bibliographic entry see Field 5I.
AD-669 398 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. III. DERIVATION OF TRAINING CHARACTERISTICS,
American Institutes for Research Pittsburgh Pa
For primary bibliographic entry see Field 5I.
AD-669 399 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. IV. PRINCIPLES AND TECHNIQUES.
American Institutes for Research Pittsburgh Pa
For primary bibliographic entry see Field 5I.
AD-669 400 HC$3.00 MF$0.65

FATIGUE TEST RESULTS AND ANALYSIS OF 11 PISTON PROVOST WINGS TO DETERMINE THE EFFECT OF ORDER OF PROGRAMMED LOAD,
British Aircraft Corp Ltd London (England)
H. E. Parish. Jan 68, 16p
MIN-TECH-S/T-Memo-5/67

Descriptors: (*Wings, Fatigue (Mechanics)), Life expectancy, Stresses, Loading (Mechanics), Tests, Failure (Mechanics), Great Britain.
Identifiers: Piston Provost wings.

Fatigue results of 11 wings programme-loaded in ascending order were compared with 41 wings tested in descending order. Results indicate a substantial reduction in the log mean life when testing in ascending order but negligible difference in variance. Comparison of these results with results from two other studies indicates that the magnitude of peak stress and shape of the spectrum applied, very much influences whether descending or ascending order of load gives the longer endurance. (Author)
AD-669 414 HC$3.00 MF$0.65

FATIGUE TEST RESULTS AND ANALYSIS OF FOUR PISTON PROVOST WINGS TESTED IN AN ASCENDING-DESCENDING ORDER OF LOADING,
British Aircraft Corp Ltd London (England)
H. E. Parish. Mar 68, 12p
MA-S/T-Memo-1/68

Descriptors: (*Wings, Fatigue (Mechanics)), Loading (Mechanics), Life expectancy, Tests, Correlation techniques, Failure (Mechanics), Great Britain.
Identifiers: Piston Provost wings.

Results of fatigue tests on four wings programme loaded in Lo-Hi-Lo order are compared with similar tests performed in Hi-Lo and Lo-Hi orders reported previously. The results lie almost mid-way between the results for Hi-Lo and Lo-Hi tests. No significant difference is shown in either the variance or mean value since the results lie within the scatter of the previous tests. (Author)
AD-669 415 HC$3.00 MF$0.65

PUBLIC HEALTH ASPECTS OF GALACTIC RADIATION EXPOSURE IN SUPERSONIC TRANSPORT,
Naval Aerospace Medical Inst Pensacola Fla
Hermann J. Schaefer. 19 Mar 68, 16p Rept no. NAMI-1033
NASA Order R-75

Descriptors: (*Jet transport planes, Radiation hazards), Supersonic planes, Stratosphere, Ionization, Flight crews, Radioactive fallout, X rays, Radiological contamination, Exposure, Dose rate, Commercial planes, High altitude, Radiobiology, Public health, Population.
Identifiers: Supersonic transport planes.

The prospect of large-scale commercial passenger transportation at SST altitudes in the lower stratosphere calls for an accurate assessment of the galactic radiation exposure. Highest radiation levels prevail at high latitudes (polar region) and solar minimum and reach about 1 millirem/hour at 65,000 feet. The accumulated dose of 0.6 rem/year which an SST crew member spending 600 hours/year at altitude would receive exceeds the Maximum Permissible Dose (MPD) for 'Members of the Public' and would classify crew members as 'Radiation Workers' in terms of official recommendations. The assumption of 50 SST each exposing 200 passengers to 1000 hours/year at SST altitude would lead to a population dose about equal to the contribution from industrial radiation workers, with both exposures ranking well below the two largest man-made additions to the natural background, medical use of x-rays and fallout. The heavy flux is attenuated to 3 per cent or less at 65,000 feet, depending on the nuclear species; yet, only 0.1 per cent of this residual flux accounts for maximum ionization hits. That means the microbeam hazard of heavy nuclei is insignificant at SST altitudes. (Author)
AD-669 451 HC$3.00 MF$0.65

AN ANALYSIS OF THE HELICOPTER HEIGHT VELOCITY DIAGRAM INCLUDING A PRACTICAL METHOD FOR ITS DETERMINATION.
Final rept.,
National Aviation Facilities Experimental Center Atlantic City N J
William J. Hanley, and Gilbert Devore. Feb 68, 36p* Rept no. NA-67-1
FAA-ADS-67-23

Descriptors: (*Helicopters, Performance (Engineering)), Flight testing, Altitude, Velocity, Airspeed, Flight speeds, Mathematical analysis, Hovering, Stalling, Weight, Standards, Diagrams.

A composite summary analysis was made of the height-velocity (H-V) diagram test data obtained from the flight testing of three single engine, sinle rotor helicopters of varying design characteristics and basic parameters. The purpose of this analysis was to ascertain if a practical method for the determination of the H-V diagram could be evolved, as well as a means to determine the effects of aircraft weight and altitude on the H-V diagram. Analysis disclosed that H-V diagrams can be developed for any conventional single rotor helicopter by the flight test determination of a single maximum performance critical speed (V sub cr) point in conjunction with the use of a non-dimensional curve and the solution of specific key point ratios which are set forth in the report. An evaluation of the H-V diagram key point relationships is presented followed by a discussion of the observed factors affecting autorotative landing following power failure. A suggested step by step procedure for flight manual type H-V diagrams is also presented. (Author)
AD-669 481 HC$3.00 MF$0.65

THE PERFORMANCE OF PROPELLERS OPERATING AT ZERO ADVANCE RATIO.
Master's thesis,
Mcgill Univ Montreal (Quebec) Mechanical Engineering Research Labs
David C. Gilmore. Sep 67, 124p Rept no. 67-9

Descriptors: (*Propellers (Aerial), Performance (Engineering)), Thrust, Propeller blades, Wake, Lift, Mathematical prediction, Canada, Theses, Measurement, Anemometers, Accuracy, Data processing systems.
Identifiers: *Static thrust propellers, Advance ratio.

The thesis is concerned with methods of predicting the performance, that is, the overall thrust and power, of air propellers operating at zero advance ratio. Measurements from two such propellers, often called static thrust propellers because they are designed to operate at zero forward speed, are used as a basis for evaluating the following performance prediction methods: the modified Lock - Goldstein method, and the Gartshore - Gray method. Both prediction methods give fairly good estimates of overall thrust. The former method gives a poor radial distribution of thrust while that of the latter method is relatively good. Conventional strip analysis is also evaluated using measured inflow velocities and while agreement between theory and experiment can be excellent it is conditional upon the assumptions made with respect to blade section characteristics and the use of tangential inflow velocity. (Author)
AD-669 653 HC$3.00 MF$0.65

DESIGN AND EVALUATION OF A HIGH TEMPERATURE RADIAL TURBINE.
Quarterly technical progress rept. no. 3, 1 Feb-30 Apr 68,
Pratt and Whitney Aircraft West Palm Beach Fla
Florida Research and Development Center
G. S. Calvert. 15 May 68, 38p Rept no. PWA-FR-2806

Contract DAAJ02-68-C-0003
See also AD-664 236.

Descriptors: (*Gas turbines, Design), Army aircraft, Axial-flow turbines, Turbine parts, Performance (Engineering), Aerodynamic characteristics, Temperature, Gas turbine nozzles, Cooling, Cold flow tests.
Identifiers: *Radial turbines.

The objective of the contract is to develop a technology for high temperature radial turbines to a level that will permit a potential small-engine-manufacturer to make a choice between the radial and the axial turbine. The double-pass rotor design was adopted as the preferred rotor configuration for the turbine. Aerodynamic refinement of the turbine continued. Aerodynamic analysis of the cold flow rotors was completed, and the analytical conclusions drawn from these analyses were confirmed by cold flow tests, which are now 80% complete. Water rig testing was completed, and results indicated the type of losses associated with tip ejection of the rotor cooling air. Steady-state heat transfer analyses were completed, and transient heat transfer studies are now in progress. Metallurgical testing of the rotor specimens is now 80% complete; observed tensile properties are satisfactory, but creep-rupture properties continue to be low. (Author)
AD-669 664 HC$3.00 MF$0.65

LIFTING OF AERODYNAMIC DECELERATORS.
Final technical rept.,
Stencel Aero Engineering Corp Asheville N C
Ronald W. Oates, Charles A. Yost, and A. L. Martinez. Nov 66, 76p
USA-NLABS-TR-68-66-AD
Contract DA-19-129-AMC-850 (N)

Descriptors: (*Drag parachutes, Lift), (*Air drop operations, *Cargo parachutes), Performance (Engineering), Computer programs, Trajectories, Inflatable structures, Weight, Geometric forms, Aviation safety, Costs, Logistics, Training, Reliability, Low altitude, Army operations.
Identifiers: Parachute canopies, *LOADS (Lifting of Aerodynamic Decelerators), *Lifting of aerodynamic decelerators.

Progress is reported for all work accomplished on the following activities: (1) analytical studies-parachute dynamics, parachute performance required for low level cargo delivery; computer trajectory program, performance summary and conclusions; (2) runway level test results of parachute inflation and force-time histories with aerodynamic assistance and lifting canopies; (3) weight and size limits, flight safety, system weight and cost, logistics and training; (4) functional reliability. (Author)
AD-669 665 HC$3.00 MF$0.65

ENVIRONMENTAL EFFECTS REPORT FOR HELICOPTER INSTRUMENT TRAINER DEVICE 2B10A.
Revised ed.,
Melpar Inc Falls Church Va
D. M. Crowe, and J. F. Kerins. 1 May 65, 29p
Rept no. Revision no. 1
NAVTRADEVCEN-1438-4
Contract N61339-1438
Revision of report dated Sep. 63.

Descriptors: (*Helicopters, Training devices), (*Training devices, Simulation), Helicopter rotors, Atmospheric motion, Vibration, Visual perception, Environment, Sound, Meteorological parameters, Instrument panels.
Identifiers: SH-3A aircraft, H-3 aircraft, CH-46A aircraft, H-46 aircraft.

The report presents the environmental effects simulation techniques for the helicopter instrument trainer, Device 2B10A. There are two modes of operation: single rotor helicopter simulation of the SH-3A type and tandem rotor helicopter simulation of the CH-46A type. (Author)
AD-669 671 HC$3.00 MF$0.65

AIRCRAFT PENNANT INVESTIGATION,
Aeroplane and Armament Experimental Establishment Boscombe Down (England)
M. G. Battersby. 5 Dec 67, 10p Rept no. AAEE/Tech/366/TS

Descriptors: (*Protective coverings, Visual signals), (*Warning systems, Visual signals), (*Textiles, *Colors), Fibers (Synthetic), Polyester plastics, Cotton textiles, Aircraft, Design, Aviation safety, Great Britain.
Identifiers: *Aircraft warning pennants, Terylene.

An inspection of aircraft warning pennants in current use showed that the use of a dull red colour against a variety of aircraft colour schemes limited their effectiveness and they became dirty and dilapidated quickly in service. Tests of an alternative material using a three colour striped pattern proved most satisfactory and pennants of this material are in use. It is recommended that other aircraft operators should consider providing similar type pennants. (Author)
AD-669 675 HC$3.00 MF$0.65

EVALUATION OF THE DUST CLOUD GENERATED BY HELICOPTER ROTOR DOWNWASH.
Final rept.,
MSA Research Corp Evans City Pa
Sheridan J. Rodgers. Mar 68, 35p
USAAVLABS-TR-67-81
Contract DA-44-177-AMC-289 (T)

Descriptors: (*Helicopter rotors, *Ground effect), (*Dust, Downwash), Particle size, Pilots, Visibility, Soils, Helicopter engines, Life expectancy, Erosion, Hovering, Sampling, Rotor blades (Rotary wings), Ingestion (Engines), Engine air systems components.
Identifiers: H-21 aircraft, H-34 aircraft.

The dust cloud generated by a tandem-rotor H-21 helicopter was studied as a function of type of soil, hover height and disc loading. A total of 98 tests were made, and three different test sites were used. Samples were collected at 25 locations on the helicopter. Analyses were made for dust content and particle size distribution. Average dust concentrations at the area of highest dust density, i.e., at rotor blade overlap, are given. The highest concentrations were measured at the site of rotor blade overlap, and the lowest concentrations were found beneath the rotor hubs. The maximum particle size decreased with increasing elevation. No particles over 500 microns were found at any elevation. Dust concentrations of 40 mg/cu ft were measured during takeoff and approach maneuvers. With another helicopter hovering in the immediate area, concentrations of 64 mg/cu ft were measured. (Author)
AD-669 676 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY-BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME I. USER'S MANUAL.
Douglas Aircraft Co., Inc., Long Beach, Calif.
For primary bibliographic entry see Field 1A.
AD-817 158 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME II. PROGRAM FORMULATION AND LISTINGS.
Douglas Aircraft Co., Inc., Long Beach, Calif.
For primary bibliographic entry see Field 1A.
AD-817 159 HC$3.00 MF$0.65

DYNAMIC TESTS ON FREE-FLYING MODELS OF SLENDER WINGS SUBJECTED TO SIDE-GUSTS.
Aeronautical Research Council (Gt. Brit.)
W. E. Gray. Aug 64, 17p ARC-R+M-3460
17 P Refs

Descriptors: *Dynamic models, *Free flight, *Gust loads, *Slender wings, Aerodynamic forces, Fixed wings, Lateral oscillation, Scale models, Wind tunnels, Yaw.

For abstract, see STAR 06 12.
N68-21908 HC$3.00 MF$0.65

EFFECTS OF SIMULATED WING DAMAGE ON THE AERODYNAMIC CHARACTERISTICS OF A SWEPT-WING AIRPLANE MODEL.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
C. Hayes. Apr 68, 70p NASA-TM-X-1550
Contract 126-13-02-04-23

Descriptors: *Aerodynamic characteristics, *Aircraft models, *Swept wings, Angle of attack, Graphs (charts), Leading edges, Rolling moments, Trailing edges, Wing panels.

For abstract, see STAR 06 12.
N68-22002 HC$3.00 MF$0.65

AN INVESTIGATION OF THE HELICOPTER HEIGHT VELOCITY DIAGRAM SHOWING EFFECTS OF DENSITY ALTITUDE AND GROSS WEIGHT.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
R. J. Pegg. May 68, 33p NASA-TN-D-4536

Descriptors: *Airspeed, *Autorotation, *Diagrams, *Height, *Helicopters, Atmospheric density, Numerical analysis, Structural weight.

For abstract, see STAR 06 12.
N68-22033 HC$3.00 MF$0.65

SUMMARY OF VGH DATA COLLECTED ON ONE TYPE OF TWIN-ENGINE JET AIRPLANE DURING AIRLINE OPERATIONS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
M. E. Brazziel, and P. A. Hunter. May 68, 32p
NASA-TN-D-4529
Contract 126-61-01-01-23

Descriptors: *Airline operations, *Angular acceleration, *Gusts, *Jet aircraft, Aircraft landing, Airspeed, Commercial aircraft, Loading rate, Turbojet engines, Turboprop aircraft, Turbulence.

For abstract, see STAR 06 12.
N68-22291 HC$3.00 MF$0.65

MANEUVERABILITY AND GUST RESPONSE PROBLEMS ASSOCIATED WITH LOW-ALTITUDE, HIGH-SPEED FLIGHT.
Advisory Group for Aerospace Research and Development, Paris (France).
R. C. Aharrah. Oct 67, 65p AGARD-556

Descriptors: *Bibliographies, *Flight control, *Low altitude, *Maneuverability, *Military aircraft, Aerodynamic stability, Atmospheric turbulence, Center of gravity, Gust loads, Rigid structures.

For abstract, see STAR 06 12.
N68-22320 HC$3.00 MF$0.65

FLUID DYNAMICS OF ROTOR AND FAN SUPPORTED AIRCRAFT AT SUBSONIC SPEEDS.
Advisory Group for Aerospace Research and Development, Paris (France).
Sep 67, 488p AGARD-CP-22
Conf- Presented At the Specialists Meeting of the Fluid Dyn. Panel of Agard, Goettingen, W. Germany, 11-13 Sep. 1967

Descriptors: *Conferences, *Rotor aerodynamics, *Vertical takeoff aircraft, Aerodynamic characteristics, Aircraft design, Airfoils, Fluid dynamics, Lift drag ratio, Noise reduction, Rotary wings, Separated flow, Subsonic flow.

For abstract, see STAR 06 12.
N68-22486 HC$3.00 MF$0.65

MEASUREMENTS OF WING BUFFETING ON A SCIMITAR MODEL.
Aeronautical Research Council (Gt. Brit.)
D. G. Mabey. 1967. 25p ARC-CP-954, RAE-TR-66160

Descriptors: *Scale models, *Scimitar aircraft, *Wing oscillations, *Wing roots, Aircraft models, Buffeting, Wind tunnel models, Wind tunnel stability tests.

For abstract, see STAR 06 12.
N68-22655 HC$3.00 MF$0.65

ON THE HISTORICAL DEVELOPMENT OF FLIGHT DYNAMICS.
Zur Entwicklungsgeschichte Der Flugmechanik
National Aeronautics and Space Administration, Washington, D. C.
H. Herb. Apr 68, 154p NASA-TT-F-498
Tran- Transl. Into English From the German Rept. Drl-67-44

Descriptors: *Aerodynamic characteristics, *Aeronautical engineering, *Histories, *Product development, Aircraft configurations, Aircraft performance, Civil aviation, Data processing, Data reduction, Flight control, Military aviation.

For abstract, see STAR 06 12.
N68-22730 HC$3.00

AIRCRAFT ACCIDENT REPORT. FRONTIER AIRLINES, INC. DOUGLAS DC-3C, N65276, STAPLETON INTERNATIONAL AIRPORT, DENVER, COLORADO. DECEMBER 21, 1967.
National Transportation Safety Board, Washington, D. C.
20 Mar 68, 18p*
Also available on subscription, $12.00/yr, $15.00/yr foreign.

Descriptors: (*Commercial planes, *Aviation accidents), Take-off, Elevators, Tails (Aircraft), Analysis, Pilots, Performance (Human), Damage assessment, Casualties, Ground support equipment.

At 1600 m.s.t., December 21, 1967, Frontier Airlines cargo flight 2610, a DC-3C, N65276, crashed during takeoff from runway 35 at the Stapleton International Airport, Denver, Colorado. The captain and first officer, the only occupants of the aircraft, were killed. The aircraft was destroyed by impact and fire. Investigation revealed that the takeoff had been made with a control batten of gust lock in place on the right elevator. The Safety Board determines that the probable cause of this accident was the failure of the crew to perform a pre-takeoff control check resulting in takeoff with the elevators immobilized by a control batten. (Author)
PB-177 339-4 HC$3.00 MF$0.65

1D. Aircraft Flight Control and Instrumentation

FIBERCELL OVERHEAT HAZARD DETECTION SYSTEM.
Technical rept. (Final), Mar 67-Feb 68,
Whittaker Corp San Diego Calif Narmco Research and Development Div
Stanley Yalof. May 68, 80p
AFAPL-TR-68-44
Contract F33615-67-C-1613

Descriptors: (*Temperature sensitive elements, Electrolytic cells), (*Aviation safety, Sensors), Thermal batteries, Probes, Airborne, Ceramic materials, Lithium compounds, Boron compounds, Silicates, Aircraft engines, Aircraft equipment, Heating, Warning systems, Fire alarm systems, Design, Performance (Engineering).
Identifiers: Fibercells, Overheat hazard detectors.

The purpose of the program was the development of an airborne overheat hazard detection system, utilizing the proprietary power-generating Fibercell concept as the sensor. Such a sensor must have a detection capability in the primary temperature range from 300F to 1000F, plus the capacity to withstand transient temperatures in excess of these limits. In general, Fibercell consists of a ceramic electrolyte electrochemical cell in the shape of a fiber, which is dependent on its temperature for electrical power output. Since the electrolyte resistivity is logarithmically related to temperature, the cell power output lessens rapidly with decreasing temperature. Below a particular temperature (determined by ceramic electrolyte composition), the cell is effectively disconnected from the alarm system -- a behavior that lends itself to long service life of the cell. During this program, developmental work was directed toward: an improvement of Fibercell performance at the lower end of its operating range; the design of sensors for airborne alarm systems; and the evaluation of sensors under simulated alarm and aircraft conditions to determine their mechanical stamina, as well as their performance as overheat condition sensors. (Author)
AD-669 382 HC$3.00 MF$0.65

1E. Air Facilities

BIRD HAZARDS TO AIRCRAFT - A LITERATURE SURVEY, JANUARY 1947 - SEPTEMBER 1967.
Technisch Documentatie en Informatie Centrum Voor de Krijgsmacht, the Hague (Netherlands).
J. Wijnen. Oct 67, 55p TDCK-49208
Lang- in French, English, German, and Dutch

Descriptors: *Aircraft hazards, *Bibliographies, *Birds, *Flight hazards, Abstracts, Aircraft safety, Impact damage, Ingestion (engines), Literature.

For abstract, see STAR 06 12.
N68-22034 HC$3.00

RUNWAY GROOVING FOR INCREASING TIRE TRACTION - THE CURRENT PROGRAM AND AN ASSESSMENT OF AVAILABLE RESULTS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
G. W. Brooks, and W. B. Horne. 1967, 18p
NASA-TM-X-61061, L-5972
Conf- Presented At the 20th Ann. Intern. Air Safety Seminar, Williamsburg, Va., 4-7 Dec. 1967

Descriptors: *Aircraft tires, *Airports, *Runways, Ice, Runway conditions, Slush, Treads.

For abstract, see STAR 06 12.
N68-22063 HC$3.00 MF$0.65

2. AGRICULTURE

2A. Agricultural Chemistry

SOLUBILITY IN THE SYSTEM (NH4)2HPO4-(NH4)2SO4-H2SO4-H3PO4-H2O,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7D.
PB-178 090T HC$3.00 MF$0.65

SOLUBILITY OF AMMONIUM SULFATE IN THE PRESENCE OF SULFURIC AND PHOSPHORIC ACIDS AND ALSO AMMONIUM PHOSPHATES,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7D.
PB-178 091T HC$3.00 MF$0.65

PREPARATION OF CONCENTRATED PHOSPHATE FERTILIZERS BY DISTILLATION OF NITRIC ACID EXTRACTS,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
Z. A. Proinova, and N. L. Minkova. 26 May 66, 14p TVA-4186
Trans. of Khimicheskaya Promyshlennost (USSR) n9 p665-70 1963, tr. by Carol C. Parr.

Descriptors: (*Fertilizers, Preparation), (*Phosphates, Preparation), Nitric acid, Distillation, Calcium compounds, Phase studies, Reaction kinetics, Thermodynamics, USSR.
Identifiers: Calcium phosphates.

A system is proposed which has the following advantages in comparison with the classical method. It makes it possible to produce a high-analysis fertilizer--monocalcium phosphate--directly since there is no stage of secondary decomposition of apatite. Moreover, a large portion of the impurities is removed by defluorination. A continuous production process is achieved without recycling the product, and it is not necessary to cure the product in a warehouse. The system makes it possible to conduct the process with a closed cycle of nitric acid which should significantly reduce the manufacturing cost of P2O5 according to preliminary calculations. It is possible to simultaneously produce concentrated and complex fertilizers according to this system (with certain supplementary installations). (Author)
PB-178 093T HC$3.00 MF$0.65

SOLUBILITY IN SYSTEMS CONTAINING UREA AND AMMONIUM PHOSPHATES,
Tennessee Valley Authority, Oak Ridge, Wilson Dam, Ala.
For primary bibliographic entry see Field 7D.
PB-178 098T HC$3.00 MF$0.65

COMPLEX PROCESSING OF COMMON SALT. III. DECOMPOSITION OF APATITE CONCENTRATE BY AMMONIUM BISULFATE,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7A.
PB-178 107T HC$3.00 MF$0.65

THE COMPLEX TREATMENT OF COMMON SALT. IV. THE DECOMPOSITION OF APATITE CONCENTRATE BY A MIXTURE OF AMMONIUM SULFATE-BISULFATE AND THE CHEMICAL MECHANISM OF THE PROCESS,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7A.
PB-178 108T HC$3.00 MF$0.65

2B. Agricultural Economics

LINK SYSTEM AND FARM REFORM ISSUE.
Joint Publications Research Service, Washington, D. C.
23 Feb 68, 52p

Descriptors: (*Agriculture, USSR), Cereals, Costs, Swine, Production, Rural areas, Labor, Mammals, Management planning, Organizations, Cotton.

Contents: Letter from a mechanized team about improvements in grain-growing operations in Stavropolskiy Kray; Cost-accounting links on pig-raising farm in Penzenskaya oblast; Cotton-growing by cost-accounting links in Uzbekistan; Need for increasing grain yield per hectare on Sovkhozes and Kolkhozes in the RSFSR; Continuation of a discussion about a new, progressive organization of labor in rural areas which was begun by the Stavropol' mechanizers; Link system on sheep-breeding Sovkhozes in Turkmen SSR; Improvements made in the work of party committees in Belorussian SSR; Production and planning difficulties encountered by Kolkhoz in the suburbs of Moscow; Link organization in agriculture; Improved use of land by Grodnenskaya Oblast Kolkhozed discussed.
JPRS-44472 HC$3.00 MF$0.65

EVALUATION OF BOUNDARY ALTERNATIVES FOR PROPOSED UPPER GREAT PLAINS ECONOMIC DEVELOPMENT REGION.
Upper Midwest Research and Development Council, Minneapolis, Minn.
For primary bibliographic entry see Field 13B.
PB-176 883 HC$3.00 MF$0.65

2C. Agricultural Engineering

THE PROBLEMS OF ESTIMATING THE RELIABILITY AND LIFE OF PLOWSHARES,
National Tillage Machinery Lab., Auburn, Ala.
E. D. Afonin. 31 Aug 67, 7p
Trans. of Selsko-Khozyaistvennyi Institut, Kuibyshev. Izvestiya (USSR) v18 p33-7 1966.

Descriptors: (*Earth-handling equipment, USSR), (*Agriculture, Earth-handling equipment), Reliability, Design, Life expectancy, Machines, Soils, Mathematical analysis, Steel, Wear resistance, Flexural strength, Operation, Climatology.
Identifiers: Translations.

The problem of the reliability and life of plowshares interests not only designers but also scientists and development personnel. It concerns the customer - the user - to a large degree. The working capacity of the plowshare depends on many factors: soil climatic conditions, wear resistance of the materials, the strength of the materials, design of the plowshare. The work capacity is characterized by reliability and their life in operation. The reliability and durability are not directly connected, hence, shares can meet reliability requirements but not be durable.
PB-176 834T HC$3.00 MF$0.65

THE PROBLEM OF SPACING SWEEPS ON CULTIVATOR FRAMES,
National Tillage Machinery Lab., Auburn, Ala.
V. P. Gnilomedov. 7 Aug 67, 10p
Trans. of Selsko-Khozyaistvennyi Institut, Kuibyshev. Izvestiya (USSR) v18 p25-32 1966.

Descriptors: (*Machines, USSR), (*Agriculture, Machines), Soils, Design, Cutting tools, Series, Deformation, Particle size, Distribution, Mathematical analysis, Velocity.
Identifiers: Translations.

The problem of exact spacing of cultivator sweeps on the frames of machines has special important significance. The incorrect spacing of working tools in the line of travel brings about a clogging of the shanks of the working tools, makes the level of the surface of the soil worse, and increases the energy expenditure during the operation of the cultivator. The objective of the present work was the determination of the optimum distance between rows of cultivator sweeps in the line of travel. The work was expanded to cultivators equipped with the production series arrow-shaped sweeps and half sweeps for overall and inter-row soil working. (Author)
PB-176 835T HC$3.00 MF$0.65

THE PROBLEM OF THE THEORY OF OPERATION OF PLOW SHARES,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 8M.
PB-176 836T HC$3.00 MF$0.65

DESIGN OF COULTERS FOR OPERATING AT SPEEDS OF 9-15 KM/HR,
National Tillage Machinery Lab., Auburn, Ala.
N. I. Lyubushko. 12 Jul 67, 10p
Trans. of Mekhanizatsiya i Elektrifikatsiya Sotsialisticheskogo Selskogo Khozyaistva (USSR) v22 n5 p18-22 1964, tr. by William R. Gill.

Descriptors: (*Agriculture, USSR), (*Machines, Design), Velocity, Seeds, Wheat, Drills, Soils, Moisture, Hardness, Thickness, Cereals, Disks, Soil mechanics.
Identifiers: Translations.
PB-178 142T HC$3.00 MF$0.65

2E. Animal Husbandry

DIFFERENTIATION OF STREPTOCOCCUS PLUTON AND BACTERIUM PLUTON (DIFFERENTSIATSIYA STREPTOCOCCUS PLUTON I BACTERIUM PLUTON).
National Agricultural Library, Beltsville, Md. Bee Culture Branch.
For primary bibliographic entry see Field 6M.
PB-178 152T HC$3.00 MF$0.65

2F. Forestry

ECONOMIC EVALUATION AND CHOICE IN OLD-GROWTH DOUGLAS - FIR LANDSCAPE MANAGEMENT.
Forest Service Research paper,
Pacific Northwest Forest and Range Experiment Station. Portland, Ore.
Wesley M. Rickard, Jay M. Hughes, and Carl A. Newport. Nov 67, 41p FSRP-PNW-49

Descriptors: (*Forestry, Economics), Trees, Cutting, Decision making, Management planning, Costs, Growth, Tables.

Present net worths for several timber cutting practices over a range of old-growth Douglas-fir stand conditions are presented. These practices are viewed as possible treatment alternatives where esthetic yield is also important. Two processes are proposed for instances where management decisions require simultaneous consideration of dollar and nondollar consequences of alternative cutting practices: (1) the simple betterness method and (2) the compensation technique. (Author)
PB-178 077 HC$3.00 MF$0.65

TRANSPORT AND COMBUSTION OF FIREBANDS. VOLUME II.
Final rept. on Volume 2,
Instituto Nacional de Tecnica Aeroespacial, Madrid (Spain).
Carlos Sanchez Tarifa. May 67, 95p*
Grants FG-SP-114, FG-SP-146
See also Volume 1, PB-178 193.

Descriptors: (*Forest fires, Flame propagation), (*Flight paths, Mathematical prediction), Convection (Atmospheric), Wind, Wind tunnels, Simulation, Aerodynamic characteristics, Velocity, Falling bodies, Equations of state, Mathematical models, Combustion, Wood, Forestry.
Identifiers: Firebrands.

A theoretical and experimental study has been carried out on the combustion properties and flight paths of firebrands when they are carried upwards by convective currents and then forwards by the winds. The study has shown that the flight paths of firebrands can be accurately calculated by assuming that they fly at their terminal velocity of fall. This velocity of fall decreases continuously as the firebrand burns. Several types of wind tunnels have been developed especially designed to study combustion of firebrands at their final velocity of fall. The study has also shown that combustion and flight paths of firebrands can also be calculated from data obtained on the combustion of firebrands at constant wind speed. The influence of the initial size and initial shape of the firebrands, kind of wood and initial moisture content has been studied, as well as the influence of several types of convection columns configurations.
PB-178 194 HC$3.00 MF$0.65

THEORETICAL AND PRACTICAL IMPORTANCE OF STUDYING THE SERBIAN SPRUCE ECOLOGY,
National Science Foundation, Washington, D. C. Special Foreign Currecny Science Information Program.
Dusan B. Colic. 1968, 13p SFCSI-Agr (TT-67-58008)
Trans. of Sumarstvo (Yugoslavia) v13 n1/2 p104-10 1960, tr. by Mihailo Markovic.

Descriptors: (*Trees, *Ecology), Bibliographies, Forestry, Physiology, Distribution, Yugoslavia, Classification.
Identifiers: Picea omorica.

Justification is given for an ecological study of Picea omorica undertaken by the Botanical Section of the Serbian Institute of Biology. A brief review of previous work in this area is accompanied by a 90-item bibliography.
TT-67-58008 HC$3.00 MF$0.65

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

LABORATORY SIMULATION OF LUNAR LUMINESCENCE WITH SPECIAL REFERENCE TO METEORITIC MATERIAL.
Scientific rept. (Final), 15 Mar 64-14 Mar 67,
Manchester Coll of Science and Technology (England) Dept of Physics
J. E. Geake, M. D. Lumb, and G. Walker. Dec 67, 30p
AFCRL-68-0235
Contract AF 61 (052)-798

Descriptors: (*Meteorites, Luminescence), (*Moon, Meteorites), Models (Simulations), Spectra (Visible + ultraviolet), Materials, Powders, Rock (Geology), Spectrum signatures, Protons, Excitation, Sampling, Emissivity, Thermoluminescence, Spectrophotometers, Ultraviolet radiation, Efficiency, Band spectrum, Photoelectric effect.
Identifiers: Enstatite achondrites.

Apparatus is described for the irradiation of powdered rock samples with protons or UV radiation. The spectrum of any resulting luminescence emission is scanned by a photoelectric grating spectrophotometer. Material from meteorites of several different classes has been found to luminesce under proton excitation: UV radiation is relatively ineffective. The spectra of 20 of them are given and are found to be characteristic of the class of meteorite. The efficiencies fall into 3 groups, the most efficient being the enstatite achondrites at about 1%; these have a bright red emission peak at 6700A and a fainter blue one at 4000A. The enstatite constituent is responsible for the luminescence, but the emission may be predominantly red or blue depending on the manganese content. The spectrum has been reproduced using synthetic samples. Proton damage effects and recovery processes are discussed; spectral changes after damage are also characteristic of the class. The relevance of this type of luminescent material to lunar luminescence is discussed; thermoluminescence of the same type of material may be more relevant than directly excited luminescence. (Author)
AD-669 327 HC$3.00 MF$0.65

NEAR INFRARED PHOTOMETRY OF LATE TYPE STARS.
Environmental research papers no. 281,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Russell G. Walker. Feb 68, 33p Rept no.
AFCRL-68-0042
Presented at the Discussion Meeting on Infrared Astronomy, The Royal Society, London (England) 1 May 1967.

Descriptors: (*Stars, Infrared radiation), Infrared spectrophotometers, Band spectrum, Predictions,

Spectra (Infrared), Corrections, Atmosphere models, Intensity, Colors, Periodic variations, Telescopes, Blackbody radiation, Temperature, Errors, Calibration, Mathematical analysis, Spectra (Visible + ultraviolet), Tables.

A multi-band photoelectric photometer for making observations in the U, B, V, and infrared bands W (1.06 microns) X (1.13 microns), Y (1.63 microns) and Z (2.21 microns) was constructed and applied to both stellar and planetary observations. The results of photometry obtained for 61 stars are presented. The observations at lambda = 1.63 microns are shown to exhibit an excess flux due to a minimum in the H opacity in accordance with the predictions of model atmosphere studies. Bolometric corrections are derived for stars of late spectral type from integration of the observed absolute spectral irradiance curve. A simple photometric method for measuring stellar diameters is proposed based upon the absolute irradiance observed at 2.21 microns and the 2.21 microns flux at the surface of the star calculated from model atmospheres. Angular diameters derived by this technique are consistent with interferometric results and, when combined with the bolometric corrections, effective temperatures are found. (Author)
AD-669 566 HC$3.00 MF$0.65

A NEW METHOD OF MAGNETOGRAPH OBSERVATION OF THE PHOTOSPHERIC BRIGHTNESS, VELOCITY, AND MAGNETIC FIELDS.
California Univ., Berkeley. Space Sciences Lab.
R. Howard, A. S. Tanenbaum, and J. M. Wilcox.
30 Jan 67, 29p NASA-CR-94225, AD-666112
Grant NSG-243, Contract NGR-05-003-230
Seri- Its Ser. No. 9, Issue No. 7

Descriptors: *Magnetometers, *Photosphere, *Recording instruments, *Solar magnetic field, *Velocity distribution, Brightness, Line spectra, Rotation, Solar atmosphere.

For abstract, see STAR 06 12.
N68-21896 HC$3.00 MF$0.65

RECENT TECHNIQUES IN SOLAR OPTICAL ASTRONOMY FROM SPACE.
Harvard Coll. Observatory, Cambridge, Mass.
E. M. Reeves. Dec 67, 28p NASA-CR-94365, TR-6
Contracts NASW-184, NAS5-3949
Conf- Presented At the 13th Gen. Assembly of the Intern. Astron. Union Prague, Aug. 1967

Descriptors: *Optical measuring instruments, *Solar instruments, *Solar observatories, Aluminum coatings, Astronomy, Photographic film, Reflectance, Solar activity, Ultraviolet reflection.

For abstract, see STAR 06 12.
N68-22253 HC$3.00 MF$0.65

AN ANALYSIS OF THE MARINER 4 PHOTOGRAPHY OF MARS.
Smithsonian Astrophysical Observatory, Cambridge, Mass.
C. R. Chapman, J. B. Pollack, and C. Sagan. 14 Feb 68, 89p NASA-CR-94358, SAO-SR-268
Contract NGR-09-015-023

Descriptors: *Craters, *Mariner 4 space probe, *Mars surface, *Photointerpretation, *Spaceborne photography, Dust, Erosion, Impact damage, Topography.

For abstract, see STAR 06 12.
N68-22319 HC$3.00 MF$0.65

THE AUTOMATION OF A STELLAR PROPER MOTION MEASURING SYSTEM ANNUAL REPORT, 1 JUL. 1966 - 30 JUN. 1967.
Control Data Corp., Minneapolis, Minn. Minnesota Univ., Minneapolis. Aerospace Research Dept.
W. Gysling, J. S. Newcomb, R. D. Willey, and G. E. Zenk. 30 Jun 67, 123p NASA-CR-94336, AR-2
Contract NSR-24-005-062
Prep- Prepared for Minn. Univ., Minneapolis

Descriptors: *Optical scanners, *Star trackers, *Stellar motions, Control equipment, Data acquisition, Data processing equipment, Display devices, Electronic equipment.

For abstract, see STAR 06 12.
N68-22454 HC$3.00 MF$0.65

LUNAR PHOTO STUDY, PHASE 2 FINAL REPORT, 1 NOV. 1965 - 1 NOV. 1966.
Eastman Kodak Co., Rochester, N. Y. Apparatus and Optical Div.
For primary bibliographic entry see Field 14E.
For abstract, see STAR 06 12.
N68-22467 HC$3.00 MF$0.65

PHOTOHELIOGRAPH STUDY FOR THE APOLLO TELESCOPE MOUNT.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
J. D. Allen, R. A. Happe, L. M. Michal, E. H. Rehnborg, and L. M. Snyder. 1 Nov 67, 110p NASA-CR-94389, JPL-TM-33-369
Contract NAS7-100

Descriptors: *Apollo applications program, *Cassegrain optics, *Manned orbital telescopes, *Reflecting telescopes, *Spectroheliographs, Mounting, Solar instruments.

For abstract, see STAR 06 12.
N68-22923 HC$3.00 MF$0.65

3B. Astrophysics

COHERENT AMPLIFICATION OF RADIO EMISSION IN THE COSMIC MEDIUM (KOGERENTNOE USILENIE RADIOIZLUCHENIYA V KOSMICHESKOI SREDE),
American Meteorological Society Boston Mass
D. A. Varshalovich. Nov 66, 9p Rept no. T-R-635
Contract AF 19 (628)-3880
Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki (USSR) n4 (5) p180-2 1966, by Stuart W. Kellogg.

Descriptors: (*Extraterrestrial radio waves, USSR), Anisotropy, Coherent radiation, Ultraviolet radiation, Distribution, Amplifiers, Stars, Mathematical analysis, Optical properties, Emissivity, Anomalies, Interactions, Sources, Extraterrestrial radio waves, Detection.
Identifiers: Translations.

In hydrogen atoms located in an oriented flux of nonpolarized ultraviolet radiation with a continuous spectrum in the 1216-912A region, an inversion occurs in the population of the hyperfine structure levels of the ground state 1 sub S 1/2. The foregoing provides grounds for believing that coherent amplification of radiation is a widespread phenomenon in the universe. (Author)
AD-669 164 HC$3.00 MF$0.65

REFINEMENT OF THE CALCULATION OF FORBIDDEN SPECTRAL LINES (OB UTOCHENENII RASCHETA AZPRESHCHENNYKH SPEKTRALNYKH LINII),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 165 HC$3.00 MF$0.65

THE MECHANISM OF IONIZATION IN THE LOWER IONOSPHERE. PART I (O MEKHANIZME IONIZATSII NIZHNEI CHASTI IONOSFERY, I),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 4A.
AD-669 192 HC$3.00 MF$0.65

INTENSITY OF RADIATION FROM A RAYLEIGH-SCATTERING ATMOSPHERE,
Rand Corp Santa Monica Calif
Anne B. Kahle. May 68, 30p Rept no. RM-5620-PR
Contract F44620-67-C-0045

Descriptors: (*Planetary atmospheres, *Solar radiation), Rayleigh scattering, Intensity, Atmosphere models, Illumination, Sun, Absorption, Reflection, Thickness, Polarization, Mathematical models, Theory, Density.
Identifiers: Graphs (Charts).

Theoretically derived values of the directional intensity of radiation emerging from both the top and the bottom of a Rayleigh scattering atmosphere are presented graphically. The model assumes a plane-parallel atmosphere illuminated by the sun, with either a completely absorbing planetary surface or Lambert ground reflection. By using Mullikin's and Sekera's recent modification of Chandrasekhar's radiative-transfer theory, the intensities were obtained for much larger values of the optical thickness of the atmosphere than was previously possible. These intensities are given for a wide range of optical thicknesses, solar zenith angles, and directions of emergence. (Author)
AD-669 343 HC$3.00 MF$0.65

OBSERVATION AND FORECASTING OF SOLAR PROTON EVENTS.
Air Force Surveys in Geophysics no. 203,
Air Force Cambridge Research Labs L G Hanscom Field Mass
John P. Castelli. Mar 68, 28p Rept no. AFCRL-68-0104

Descriptors: (*Extraterrestrial radio waves, Solar flares), (*Solar flares, Protons), Spectrum signatures, Microwave frequency, Aurorae, Magnetic storms, Solar disturbances, Predictions.
Identifiers: Proton event warning, Polar cap absorption.

Solar burst characteristics in the radio microwave region are used to differentiate between large flares that might produce proton events and those that might not. Proton events produce high-level absorption, disrupt polar communications, and can be dangerous to man and equipment in space. They may precede the auroral and magnetic storms that disturb many radiowave propagation systems. The probability of a proton event can now be predicted, an AFCRL study of the characteristics of flare-associated centimeter radar bursts having established that a signature of proton events is a high flux density in the 3-cm region and a particular burst peak flux spectral configuration. (Author)
AD-669 347 HC$3.00 MF$0.65

TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE. SUPPLEMENT IV.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 7D.
AD-669 355 HC$3.00 MF$0.65

MAN'S TOLERANCE TO TRACE CONTAMINANTS,
Aerospace Medical Research Labs Wright-Patterson AFB Ohio
A. A. Thomas. Jan 68, 45p Rept no. AMRL-TR-67-146
Presented at the Conference on Bioastronautics, Virginia Polytechnic Institute, Blacksburg, Va., 14-18 Aug 1967.

Descriptors: (*Space environmental conditions, *Contamination), (*Tolerances (Physiology),

Space environmental conditions), Closed ecological systems, Oxygen, Toxic tolerances, Exposure, Toxicity, Stress (Physiology), Chemical properties, Microanalysis, Spacecraft cabins, Chemicals, Metabolism, Air pollution.

Atmospheric contaminants in sealed cabins originate from a multitude of sources: off-gassing from cabin materials, production of contaminants by the life support system components, and the end products of human metabolism. The scope of the problem increases with progressing mission duration and can become the limiting factor for man's tolerance to extended space flight. Several important aspects must be considered: truly uninterrupted, continuous exposure, a combination of physiological stress from the use of artificial atmospheres and the chemical stress imposed by the trace contaminants, and the great potential of synergistic toxic effect by various constituents of the highly complex mixture of many contaminants. Superimposed on these factors are the other aggravating characteristics of prolonged space flight: logistics problems of life support and psychological effects of isolation on performance. Clearly, these factors must be weighed singly and in combination to allow safe design of future manned systems. Validation of human tolerance to trace contaminants can be accomplished by prolonged animal exposures coupled with mathematical model verification. Tradeoffs in life support system design can extend tolerance to contaminants and long range logistic tradeoffs should be considered by utilizing extraterrestrial resources for contaminant removal purposes. (Author)
AD-669 356 HC$3.00 MF$0.65

ATMOSPHERIC INFERENCES FROM PLANETARY LIMB DARKENING.
Final rept. 17 Dec 65-30 Apr 67,
Gca Corp Bedford Mass Gca Technology Div
Jean I. F. King. 3 Apr 68, 38p Rept no. GCA-TR-68-1-A
AFCRL-68-0188
Contract AF 19 (628)-5738

Descriptors: (*Venus (Planet), Planetary atmospheres), Atmosphere models, Atmospheric temperature, Thermal radiation, Temperature inversion, Resolution, Integral transforms.
Identifiers: Planetary limb darkening, Radiative transfer.

The theory of planetary limb darkening is developed using a parabolic limb approximation to account for the curvature of the atmosphere. The inapplicability of the plane parallel model for structural inferences from planetary limb observations is demonstrated. Closed form expressions are obtained for the optical depth, weighting function, and other radiance parameters appropriate to the problem. The peaked character of the weighting function resulting from the curved geometry makes possible, as a first approximation, a direct point-to-point inversion of the radiance profile to obtain the temperature structure. The theory is applied to the Venus limb observations of Westphal (1966) and the inferences and limitations of the data are discussed. Finally, the similarity of the radiance equation to Abel's integral leads to the expectation that the full-blown inversion problem is amenable to solution. (Author)
AD-669 377 HC$3.00 MF$0.65

STUDIES OF THE PECULIAR A STARS. V. CONTINUOUS ENERGY DISTRIBUTIONS,
Palomar Observatory Pasadena Calif
Jun Jugaku, and Wallace L. W. Sargent. 8 Mar 68, 11p
AFOSR-68-0990
Contract AF 49 (638)-1323, Grant AF-AFOSR-68-1401
Availability: Published in The Astrophysical Journal, v151 p259-67 Jan 1968.

Descriptors: (*Stars, Energy), Distribution, Models (Simulations), Temperature, Surface properties, Hydrogen, Gravity, Predictions, Light transmission, Resolution, Silicon, Manganese, Chromium, Atmosphere models, Spectroscopy.
Identifiers: Stellar atmospheres.

Spectral scans have been made of the continuous energy distributions in the wavelength region Lambda Lambda 3300-5700 of seventeen Ap stars and five A- and B-type normal stars. The scans have a resolution of 10 A and are supplemented by H gamma profiles measured on coude spectra. The peculiar stars observed include seven Mn stars, three Lambda 4200-Si and one Si-Eu-Cr stars, five Sr-Eu-Cr stars, and one star, 21 Agl, which has been described as a Si star. We first show empirically that the scans and H gamma profiles of the peculiar stars match those of normal A and B stars and then compare them with the prediction of model atmospheres computed by Mihalas. We find that the hotter normal and peculiar stars do not match the models fully, but observed Balmer discontinuities give effective temperatures in good agreement with those obtained by other methods. We obtain effective temperatures and surface gravities using only the Balmer discontinuity and the H gamma profile of each star. The atmospheres of the Ap stars do not differ in a detectable way from those of normal A or B stars. (Author)
AD-669 473 Not available from CFSTI.

MOLECULAR BAND INTENSITIES IN G AND K STARS.
Revised ed.,
Palomar Observatory Pasadena Calif
Aert Schadee. 22 Jun 67, 20p
AFOSR-68-0994
Contract AF 49 (638)-1323
Revision of report dated 24 Apr 67. Prepared in cooperation with Carnegie Institution of Washington, D. C., and California Inst. of Tech., Pasadena.

Descriptors: (*Stars, *Molecular spectroscopy), Cyanides, Hydrocarbons, Oxygen, Carbon, Carbon monoxide, Molecular association, Models (Simulations), Spectra (Infrared), Band spectrum.
Identifiers: Stellar evolution, Molecular abundances.

Intensities of CO, CH, C2 and CN bands are studied for G and K stars with various surface gravities and metal content, assuming different C, N, and O compositions. A simple method predicts the molecular intensities accurately. The dependences of the computed band intensities on the metal content, are discussed and found to be in agreement with the observations. The molecular equilibria are dominated by the association of CO. Two independent spectral features are required to determine the C and O abundances, like the G-band and an (O I) line in oxygen-rich giants. For oxygen-rich dwarfs and carbon-rich stars the second datum required to derive O and C can only be obtained from infrared CO observations. The nitrogen abundance may be determined from CN bands for carbon-rich stars, if the C-O abundance difference is known, and for oxygen-rich stars, if both the carbon and oxygen abundances are known. The division of late-type stars into oxygen-rich and carbon-rich is extremely sharp; differences of more than 1 per cent from the mathematical equality O=C places a star in either class. The optical depth of formation is a function of the CNO composition. (Author)
AD-669 546 Not available from CFSTI.

HYDROGEN MIXING BY HELIUM-SHELL FLASHES.
Scientific Interim rept.,
Princeton Univ N J Observatory
M. Schwarzschild, and R. Haerm. May 68, 10p
AFOSR-68-0961
Contract AF 49 (638)-1555
Availability: Published in Astrophysical Journal, v150 p961-70 Dec 1967.

Descriptors: (*Stars, Thermal properties), Thermonuclear reactions, Helium, Hydrogen, Convection (Heat transfer), Stability, Models (Simulations).
Identifiers: Stellar evolution, Nucleosynthesis, Population 2 stars.

Numerical calculations were carried out which cover the first 4 million years of those evolution phases in which helium burning occurs in a shell in a star of 1 solar mass and of a Population II composition. The thermal instability previously found to occur in these helium-shell-burning phases leads to relaxation oscillations--just as has already been shown by other authors for other types of stars. Thirteen consecutive relaxation cycles are covered by the present computations. In each cycle the main helium-shell flash causes a convective zone to stretch outward from the helium shell. In the initial relaxation cycles this convection zone does not reach the hydrogen-containing layers. However, cycle after cycle the main helium-shell flash increases in strength and, in consequence, causes a larger and larger convection zone. After about nine cycles the convection zone finally reaches the hydrogen-containing layers and from then on, for a short while in each cycle, hydrogen is mixed into the hot carbon-rich interior. This physical situation with its likely importance for nucleosynthesis was searched originally in connection with the helium-core flash, with, however, negative results; while now, in connection with the helium-shell flashes, the results seem to be encouragingly positive. (Author)
AD-669 549 Not available from CFSTI.

ATLAS OF LUNAR DATA. PLOTS OF IONOSPHERIC FARADAY ROTATION AND ELECTRON CONTENT VERSUS TIME. VOLUME III. 1964,
Illinois Univ Urbana Electrical Engineering Research Lab
Harold D. Webb. 1968, 353p
Contract DA-28-043-AMC-01710 (E)
See also Volume 2, AD-668 718.

Descriptors: (*Moon, Radio signals), Polarization, Electron density, Magneto-optic effect, Ionosphere, Electromagnetic wave reflections, Very high frequency, Tables.
Identifiers: Graphs (Charts).

Volume III of the Atlas of Lunar Data contains plots of the Faraday rotation angle, Omega, and plots of electron content, eta, both plotted versus CST and LTASP, for the data obtained from January 1, 1964 through December 31, 1964. Seasonal averages of eta plotted versus LTASP, are also included. The material is presented as discussed in the Description of the Atlas of Lunar Data given in Volume I. The plots for the period January 1 through June 30, 1964 are relative. The plots for the period July 1 through December 31, 1964 are based on absolute values of Omega and eta. (Author)
AD-669 624 HC$3.00 MF$0.65

INERTIAL CONFINEMENT OF EXTENDED RADIO SOURCES,
Cornell Univ Ithaca N Y Center for Radiophysics and Space Research
David S. DeYoung, and W. I. Axford. May 68, 4p
AFOSR-68-1060
Contract AF 49 (638)-1527
Prepared in cooperation with California Univ., San Diego, La Jolla.
Availability: Published in Nature, v216 n5111 p129-31 Oct 14 1967.

Descriptors: (*Extraterrestrial radio waves, Sources), Blackbody radiation, Interstellar matter, Magnetic fields, Galaxies, Density, Pressure, Mathematical prediction.
Identifiers: Plasmons, Cygnus A radio source.

The confinement of extended radio sources may be a dynamic rather than a static process where the internal pressure of the source is balanced by

the ram pressure of the intergalactic gas. (Author)
AD-669 668 Not available from CFSTI.

STATISTICAL EQUILIBRIUM MODEL ATMOSPHERES FOR EARLY-TYPE STARS. III. HYDROGEN AND HELIUM CONTINUA,
Princeton Univ N J Observatory
Dimitri Mihalas, and Michael E. Stone. May 68, 20p
AFOSR-68-1064
Contract AF 49 (638)-1555
See also Part I, AD-657 655.
Availability: Published in Astrophysical Journal, v151 n1 p293-310 Jan 1968.

Descriptors: (*Stars, Atmosphere models), Hydrogen, Helium, Ionization, Line spectrum, Atomic energy levels, Excitation, Temperature, Mathematical analysis.
Identifiers: Stellar atmospheres.

Results are presented for model atmospheres allowing for departures from LTE in hydrogen, helium, and ionized helium on the temperature range 10000 degrees K = or < Teff = or < 36000 degrees K. The essential simplifying assumption we make is that all radiative bound-bound transitions are in detailed balance. While this assumption is valid in certain physical circumstances, it is not everywhere correct, and the results derived here should be regarded as only exploratory. As was the case in earlier results, the departures we find are quite small and have only small effects upon the emergent energy distribution, so that LTE appears to be a fairly adequate approximation in the calculation of the continuous energy distribution. No information concerning line formation can be inferred from the present results. (Author)
AD-669 677 Not available from CFSTI.

AIR DENSITY AT HEIGHTS NEAR 190 km IN 1966-7, FROM THE ORBIT OF SECOR 6.
Royal Aircraft Establishment Farnborough (England)
For primary bibliographic entry see Field 4A.
AD-669 697 HC$3.00 MF$0.65

COSMOLOGY OF OUR UNIVERSE.
National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.
H.-Y. Chiu. 1967, 49p NASA-CR-94166

Descriptors: *Astrophysics, *Cosmology, *Evolution (development), *Universe, Astronomical models, Galaxies.

For abstract, see STAR 06 12.
N68-21845 HC$3.00 MF$0.65

INTERPLANETARY MAGNETIC FIELD IMP-1, MOTION PICTURE OF THE TRANSVERSE COMPONENTS.
California Univ., Berkeley. Space Sciences Lab.
N. F. Ness, A. D. Ritchie, and J. M. Wilcox. 22 Jan 68, 10p NASA-CR-94232, AD-665987
Grant NSG-243, Contract NGR-05-003-230
Seri- Its Ser. No. 9, Issue No. 5

Descriptors: *Imp, *Interplanetary magnetic fields, *Magnetometers, Interplanetary trajectories, Magnetic storms, Magnetosphere, Motion pictures, Perigees, Protons, Sun.

For abstract, see STAR 06 12.
N68-21897 HC$3.00 MF$0.65

ESRO 2- B.
National Aeronautics and Space Administration. Washington, D. C.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 06 12.
N68-21925 HC$3.00 MF$0.65

SEARCH FOR FAINT COMETS NEAR THE SUN DURING TOTALITY OF NOVEMBER 12, 1966, SOLAR ECLIPSE FINAL REPORT.
Wesleyan Univ., Middletown, Conn. Van Vleck Observatory.
J. Gibson. 25 Mar 68, 1p NASA-CR-94290
Contract NGR-07-006-003

Descriptors: *Airborne equipment, *Astronomical photography, *Cameras, *Prefocusing, *Stars, Aerial photography, Jet aircraft, Onboard equipment, Solar eclipses.

For abstract, see STAR 06 12.
N68-22046 HC$3.00 MF$0.65

DYNAMICS OF THE SOLAR WIND.
University Coll., London (England).
A. A. Faus. Dec 66, 44p ESRO-SN-5
Coll- 44 P Refs

Descriptors: *Hydrodynamic equations, *Solar corona, *Solar wind, Adiabatic conditions, Gas expansion, Interstellar space, Shock waves, Solar atmosphere.

For abstract, see STAR 06 12.
N68-22246 HC$3.00 MF$0.65

MILLIMETER-WAVE RADIOMETRY FOR RADIO ASTRONOMY FINAL REPORT, NOV. 1965 - 31 DEC. 1967.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. University of Southern Calif., Los Angeles. Electronic Sciences Lab.
W. V. Rusch, S. D. Slobin, and C. T. Stelzried. Mar 68, 78p NASA-CR-94314, USCEE-263
Contracts NAS7-100, JPL-951756
Prep- Prepared for Jpl

Descriptors: *Electromagnetic noise, *Lunar eclipses, *Millimeter waves, *Radio antennas, *Radiometers, Amplification, Antenna radiation patterns, Meteorology, Radio astronomy, Radio telescopes, Solar radiation, Thermal emission.

For abstract, see STAR 06 12.
N68-22248 HC$3.00 MF$0.65

SOLAR-TERRESTRIAL PHYSICS - A GLOSSARY OF TERMS AND ABBREVIATIONS.
Royal Aircraft Establishment, Farnborough (England).
J. M. Gilliland. Jul 67, 214p RAE-TR-67158

Descriptors: *Astrophysics, *Dictionaries, *Symbols, Aerospace environments, Aerospace sciences, Astronomy, Cosmology, Extraterrestrial radiation, Geomagnetism, Plasma physics, Radio physics, Solar activity.

For abstract, see STAR 06 12.
N68-22279 HC$3.00 MF$0.65

AXIS OF THE ZODIACAL LIGHT AND THE CONSTANTS OF ITS PLANE OF SYMMETRY.
Die Achse des Zodiakallichts Und Die Konstanten Seiner Symmetrieflaeche
Aztec School of Languages, Inc., Acton, Mass. Research Translation Div.
C. Hoffmeister. Apr 68, 60p NASA-TT-F-11532
Contract NASW-1692
Coll- 60 P Refs Tran- Transl. Into English Astron. Nachr. (Berlin), V. 271, No. 2, 1941 P 49-67

Descriptors: *Atmospheric composition, *Sky brightness, *Symmetry, *Zodiacal light, Astronomical photometry, Extinction, Milky way galaxy, Polarized light, Sky radiation, Twilight glow.

For abstract, see STAR 06 12.
N68-22378 HC$3.00

MICROMETEORIC INVESTIGATIONS ABOARD AES KOSMOS 135.
Mikrometeornyye Issledovaniya Na Sputnike Kosmos 135
Volt Technical Corp., Washington, D. C.
R. L. Aptekar, M. M. Bredov, B. P. Konstantinov, E. P. Mazets, and V. N. Panov. 6 May 68, 19p
NASA-CR-94335, ST-IM-10710
Contract NAS5-12487
Coll- 19 P Refs Tran- Transl. Into English From Russian

Descriptors: *Acoustic measurements, *Cosmic dust, *Cosmos satellites, *Particle flux density, Artificial satellites, Collision rates, Micrometeorology, Particle collisions, Piezoelectric transducers.

For abstract, see STAR 06 12.
N68-22387 HC$3.00 MF$0.65

COSMIC RAY DEUTERIUM AND HELIUM-3 OF SECONDARY ORIGIN AND THE RESIDUAL MODULATION OF COSMIC RAYS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
R. E. Lingenfelter, and R. Ramaty. Apr 68, 55p
NASA-TM-X-63178, X-611-68-144

Descriptors: *Cosmic rays, *Deuterium, *Helium 3, *Interstellar gas, *Nuclear interactions, Bibliographies, Interplanetary magnetic fields, Interstellar space, Kinematics, Modulation.

For abstract, see STAR 06 12.
N68-22425 HC$3.00 MF$0.65

COMMENTS ON THE PAPER BY D. G. REA AND B. T. O' LEARY ON THE COMPOSITION OF THE VENUS CLOUDS.
New York Univ., N. Y. Dept. of Meteorology and Oceanography.
H. Cheyney, and J. E. Hansen. May 68, 7p
NASA-CR-94364
Grant NSG-399

Descriptors: *Clouds, *Electromagnetic scattering, *Ice, *Infrared radiation, *Venus atmosphere, Microparticles, Particle size distribution, Reflectance.

For abstract, see STAR 06 12.
N68-22470 HC$3.00 MF$0.65

ASTROPHYSICAL PHENOMENA AND RADIOCARBON.
National Aeronautics and Space Administration, Washington, D. C.
G. E. Kocharov, and B. P. Konstantinov. Apr 68, 36p NASA-TT-F-11567
Tran- Transl. Into English of the Publ. "astrofizicheskiye Yavleniya I Radiouglerod" Leningrad, Fiz.-tekhn. Inst. Im. A.F. Ioffe, 1967 P 1-43

Descriptors: *Astrophysics, *Carbon 14, *Radioactive age determination, *Solar activity, Antimatter, Carbon 13, Solar corpuscular radiation, Solar cosmic rays, Supernovae.

For abstract, see STAR 06 12.
N68-22567 HC$3.00

SUPERNOVAE EXPLOSIONS INDUCED BY PAIR PRODUCTION INSTABILITY.
California Inst. of Tech., Pasadena.
G. S. Fraley. Mar 68, 36p NASA-CR-94422
Grant NSG-426

Descriptors: *Pair production, *Supernovae, Astrophysics, Electrons, Gravitational collapse, High energy interactions, Mathematical models, Positrons, Stellar mass.

For abstract, see STAR 06 12.
N68-22685 HC$3.00 MF$0.65

RADIATIVE HEATING AND COOLING FUNCTIONS FOR THE LOWER MARTIAN ATMOSPHERE UNDER THE CONDITION OF LOCAL THERMODYNAMIC EQUILIBRIUM (LTE).
St. Louis Univ., Mo.
A. J. Pallmann. May 68, 47p NASA-CR-1044, REPT.-101
Contract NGR-26-006-016
Coll- 47 P Refs

Descriptors: *Atmospheric models, *Mars atmosphere, *Radiative heat transfer, *Solar radiation, Absorptivity, Carbon dioxide, Kirchhoff law of radiation, Molecular collisions, Radiant cooling, Temperature gradients, Thermodynamic equilibrium.

For abstract, see STAR 06 12.
N68-22860 HC$3.00 MF$0.65

EQUILIBRIUM SPECTRA OF SECONDARY COSMIC-RAY POSITRONS IN THE GALAXY AND THE SPECTRUM OF COSMIC-GAMMA-RAYS RESULTING FROM THEIR ANNIHILATION.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
F. W. Stecker. Apr 68, 45p NASA-TM-X-63187, X-640-68-135

Descriptors: *Annihilation reactions, *Formulas (mathematics), *Galactic radiation, *Gamma rays, *Secondary cosmic rays, *Spectrum analysis, Absorption spectra, Lorentz transformations, Mesons, Positrons, Scattering cross sections.

For abstract, see STAR 06 12.
N68-22925 HC$3.00 MF$0.65

THE APPROXIMATION OF STELLAR ENERGY DISTRIBUTIONS AND MAGNITUDES FROM MULTI-COLOR PHOTOMETRY.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
P. B. Davenport. Apr 68, 17p NASA-TM-X-63185, X-542-68-120

Descriptors: *Approximation, *Magnitude, *Spectral energy distribution, *Stars, *Stellar spectrophotometry, Colorimetry, Luminous intensity, Matrices (mathematics), Numerical analysis.

For abstract, see STAR 06 12.
N68-22932 HC$3.00 MF$0.65

AN ATLAS OF 10-50 KE V SOLAR FLARE X-RAYS OBSERVED BY THE OGO SATELLITES, 5 SEPTEMBER 1964 TO 31 DECEMBER 1966.
Minnesota Univ., Minneapolis. School of Physics and Astronomy.
R. L. Arnoldy, S. R. Kane, and J. R. Winckler. Jan 68, 82p NASA-CR-94429, CR-108
Contract NAS5-2071

Descriptors: *Ionization frequencies, *Ogo, *Solar radio bursts, *X rays, Charts, Ionization chambers, Ionization cross sections, Solar flares.

For abstract, see STAR 06 12.
N68-23026 HC$3.00 MF$0.65

3C. Celestial Mechanics

ON THE APPLICATION OF SPINORS TO THE PROBLEMS OF CELESTIAL MECHANICS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
K. Stumpff. May 68, 44p NASA-TN-D-4447
Contract 188-43-01-51

Descriptors: *Celestial mechanics, *Problem solving, *Three body problem, *Vectors (mathematics), Differential equations, Mathematical models, Perturbation theory, Transformations (mathematics), Two body problem.

For abstract, see STAR 06 12.
N68-22885 HC$3.00 MF$0.65

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

DENSITY DISTRIBUTION IN AN INSTRUMENT IN FREE MOLECULE FLOW (O RASPREDELENII PLOTNOSTI V PRIBORE PRI SVOBODNOMOLEKULYARNOM TECHENII),
American Meteorological Society Boston Mass
A. I. Ivanovskii, and A. I. Repnev. Dec 65, 24p Rept no. T-R-590
Contract AF 19 (628)-3880
Trans. of Tsentralnaya Aerologicheskaya Observatoriya. Trudy (USSR) n29 p51-65 1960, by Stuart W. Kellogg.

Descriptors: (*Upper atmosphere, Aerodynamic characteristics), Density, Superaerodynamics, Sensors, Distribution, Orifices, Molecular properties, Pressure, Analysis of variance, USSR.
Identifiers: *Free molecular flow, Translations.

The pressure and density measured by instruments on high-speed flying objects (rockets and artificial earth satellites) are not equal to the pressure and density of the free atmosphere, but are linked to them by interrelationships that are sometimes quite complicated. Thus far, it has been assumed in all calculations that the pressure and density are constant throughout the volume of the instrument. However, the pressure and density in the instrument may vary from point to point. Consequently, the readings of the instrument may depend on the position of the sensor. In the paper, an attempt is made to take this circumstance into account and explore the conditions under which previous solutions are correct. (Author)
AD-669 163 HC$3.00 MF$0.65

THE AUREOLE PART OF THE SCATTERING INDEX IN THE ATMOSPHERIC SURFACE BOUNDARY LAYER (OREOLNAYA CHAST INDIKATRISY RASSEYANIYA V PRIZEMNOM SLOE VOZDUKHA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 4B.
AD-669 190 HC$3.00 MF$0.65

THE MECHANISM OF IONIZATION IN THE LOWER IONOSPHERE. PART I (O MEKHANIZME IONIZATSII NIZHNEI CHASTI IONOSFERY, I),
American Meteorological Society Boston Mass
G. S. Ivanov-Kholodnyi. Mar 66, 32p Rept no. T-R-606
Contract AF 19 (628)-3880
Trans. of Geomagnetizm i Aeronomiya (USSR) v5 n4 p705-20 1965, by George E. Brady, Jr.

Descriptors: (*Ionosphere, USSR), Ionization, Solar flares, Periodic variations, Solar radiation, X rays, Spectra (Visible + ultraviolet), Ionospheric disturbances, Cosmic rays.
Identifiers: Translations, D layer.

The ionization at heights of 60 to 100 km is calculated for varying activity levels of the quiet sun and during solar flares. The following conclusions are drawn on the basis of a comparison of the results of these calculations with the data from measurements. (Author)
AD-669 192 HC$3.00 MF$0.65

OBSERVATION AND FORECASTING OF SOLAR PROTON EVENTS.
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 3B.
AD-669 347 HC$3.00 MF$0.65

VLF ELECTRIC AND MAGNETIC FIELDS OBSERVED WITH THE JAVELIN 8.45 SOUNDING ROCKET,
Iowa Univ Iowa City Dept of Physics and Astronomy
Stanley D. Shawhan, and Donald A. Gurnett.
Mar 68, 55p Rept no. 68-20
Contract Nonr-1509 (06), Grant NGR-16-001-043

Descriptors: (*Sounding rockets, Magnetic fields), (*Atmospheric sounding, Electric fields), Electromagnetic fields, Very low frequency, Emissivity, Noise (Radio), Payload, Instrumentation, Loop antennas, Altitude, Radio transmitters, Broadband, Phase studies, Intensity, Atmospherics.

The Javelin 8.45 rocket VLF experiment flown from Wallops Island at 07:38 UT, 21 September 1967, to an altitude of 763 km is described and the experiment results are discussed. This experiment carried three electric dipole and three magnetic loop antennas, five wideband receivers (30 Hz to 10 KHz), one step frequency receiver (7 KHz to 70 KHz), an instrument to measure the phase and magnitude of the electric antenna impedance (20 KHz to 20 Hz) and a VLF transmitter in the nose cone. A noise band between about 7.5 KHz and 30 KHz was observed with both the electric and magnetic receivers. The field geometry of this noise suggests that the noise is propagating perpendicular to the geomagnetic field and that the lower cutoff frequency may be the lower hybrid resonance frequency. Some evidence suggests that this electric antenna noise may be generated by the motion of the payload. (Author)
AD-669 492 HC$3.00 MF$0.65

INVASION OF PROTONS IN POLAR AURORAE (VTORZHENIE PROTONOV V POLYARNYKH SIYANIYAKH I) EKSPERIMENTALNYE REZULTATY),
Foreign Technology Div Wright-Patterson AFB Ohio
Yu. I. Galperin. 18 Aug 67, 28p Rept no. FTD-MT-65-478
Edited machine trans. of Polyarnye Siyaniya i Svechenie Nochnogo Neba: Sbornik Statei (USSR) n10 p70-9 1963.

Descriptors: (*Aurorae, USSR), Polar regions, Upper atmosphere, Luminescence, Proton reactions, Energy, Hydrogen, Spectrum signatures, Correlation techniques, Proton cross sections, Intensity, Interactions, Distribution, Height finding, Dispersion relations, Bandwidth, Electrons.
Identifiers: *Proton invasions, Translations.

The article is in two main sections: a discussion of experimental results and the theory of auroral hydrogen line glow. In the first of these sections the author considers such factors as the morphology of proton precipitation, intensity distribution as a function of height, hydrogen line profiles, the Balmer attenuation decrement, hydrogen line intensity levels and correlations with emissions of other specific character and direct measurements of proton precipitation into the auroral atmosphere. In the second part of the article, which deals with theoretical considerations on the glow of hydrogen lines under auroral conditions, the author has discussed the dependence of glow on the velocity of the particle and the role of protons in the excitation of auroral glow. Theoretical considerations on proton flux anisotropy and corresponding cross-sections are briefly reviewed. (Author)
AD-669 513 HC$3.00 MF$0.65

DEVELOPMENT OF INSTRUMENTATION WHICH WILL ALLOW MEASUREMENT OF THE INFRARED REFRACTIVE INDEX OF OZONE.
Block Engineering Inc Cambridge Mass
For primary bibliographic entry see Field 14B.
AD-669 576 HC$3.00 MF$0.65

STUDIES OF NITRIC OXIDE CHEMILUMINESCENCE USING BOUNDARY LAYER APPROXIMATIONS.

Mithras Cambridge Mass
For primary bibliographic entry see Field 20D.
AD-669 582 HC$3.00 MF$0.65

ATMOSPHERIC ELECTRICITY PROGRAM, FLAGSTAFF, ARIZONA, PART I.
Technical rept.,
Army Electronics Command Fort Monmouth N J
E. M. Frisby, and E. H. Schwartz. Dec 67, 15p
Rept no. ECOM-2907-Pt-1

Descriptors: (*Atmospheric electricity, Arizona), Weather forecasting, Thunderstorms, Electric fields, Ice, Hail, Aircraft, Cumulus clouds, Radiosondes, Periodic variations, Surface properties, Crystals, Intensity, Wind, Moisture.
Identifiers: Summer (Season), Monsoon.

The report summarizes the weather conditions that were encountered during two of the three weeks (9-21 July 1967) comprising the Army/Environmental Science Service Administration (ESSA) summer program on atmospheric electricity held at Flagstaff, Arizona, in July 1967. Short as the program was, it contained an excellent example of the 'pulsing' effect of the monsoon. In addition to the meteorological summary, the report includes a discussion of flight and weather experience, suggesting a relationship between high electrical fields and the presence of ice in the atmosphere, whether in hailstone or crystal form. (Author)
AD-669 589 HC$3.00 MF$0.65

ATMOSPHERIC ELECTRICITY PROGRAM FLAGSTAFF, ARIZONA. PART III.
Technical rept.,
Army Electronics Command Fort Monmouth N J
William C. Barr. Mar 68, 19p Rept no. ECOM-2945
See also Part 2, AD-669 591.

Descriptors: (*Atmospheric electricity, Arizona), Electric fields, Thunderstorms, Instrumentation, Cumulus clouds, Intensity, Polarization, Aircraft, Measurement, Altitude, Mathematical analysis, Surface properties, Weather stations, Static electricity.

The three components of the electric field have been measured in flights past a series of isolated thunderstorms and electrically-active cumulus clouds. Many of the clouds studied have field patterns that appear similar to those that would be experienced if the cloud were a point charge. If the cloud is assumed to be a point charge in these flights, then the magnitude and polarity of the charge can be calculated. (Author)
AD-669 590 HC$3.00 MF$0.65

ATMOSPHERIC ELECTRICITY PROGRAM FLAGSTAFF, ARIZONA, PART II.
Technical rept.,
Army Electronics Command Fort Monmouth N J
E. M. Frisby, and J. C. Kline. Feb 68, 21p Rept no. ECOM-2941-Pt-2
See also Part 3, AD-669 590.

Descriptors: (*Atmospheric electricity, Arizona), Electrometers, Surface properties, Rain, Stability, Lightning, Meteorological parameters, Thunderstorms, Clouds, Altitude.
Identifiers: Summer (Season).

Part II of the 1967 Flagstaff, Arizona Report series deals with the development at the Atmospheric Sciences Laboratory, Fort Monmouth, N. J., of several electrometers for surface use and the analysis of observations obtained from their deployment. These observations were made during June and July 1967 in the Fort Monmouth, N. J. area as well as in the vicinity of Flagstaff, Arizona. The report therefore includes comparisons between surface atmospheric electricity readings taken under differing meteorological conditions at two locations, one at sea level, the other at 7000 feet, and an attempt to relate an index of atmospheric stability to various types of electrometer readings. (Author)
AD-669 591 HC$3.00 MF$0.65

VERTICAL-INCIDENCE IONOSPHERIC DATA: THAILAND.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 17B.
AD-669 601 HC$3.00 MF$0.65

THE POWER SPECTRUM IN THE ATMOSPHERE BELOW MACROSCALE.
Final rept. Mar-Oct 67,
University of St Thomas Houston Tex Inst for Storm Research
Joseph L. Goldman. Mar 68, 41p
ECOM-367G5-F
Grant DA-AMC-28-043-67-G5

Descriptors: (*Atmosphere, Wind), Mesosphere, Power spectra, Energy, Distribution, Perturbation theory, Instrumentation, Viscosity, Frequency, Analysis of variance.

The classical analysis of power spectrum in the atmosphere by Van der Hoven has been reexamined with doubt cast on the representativeness of the spectral gap in the mesoscale. Theoretical considerations about the scale of eddies that contribute to variance in the horizontal wind tend toward a distribution of energy that decreases with frequency. In fact, the log-log distribution of variance per cycle as a function of frequency produces a slope approximating the expected -5/3 that coincides with the cascade of energy expected in the higher frequencies. Computations of the spectrum using new wind data with no long term gaps seem to confirm suspicions that Van der Hoven's spectral gap in the mesoscale may not be valid. (Author)
AD-669 678 HC$3.00 MF$0.65

BULK MOTION OF THE MAGNETOSPHERE.
Scientific Interim rept.,
Arecibo Ionospheric Observatory Puerto Rico
Neil M. Brice. 29 Feb 68, 21p
AFOSR-68-1055
Contract AF 49 (638)-1156
Availability: Published in Journal of Geophysical Research, v72 n21 p5193 Nov 1967.

Descriptors: (*Upper atmosphere, Magnetic fields), Convection (Atmospheric), Electric fields, Charged particles, Electrons, Drag, Flow fields, Diurnal variations, Interactions, Models (Simulations), Protons, Distribution, Mathematical analysis, Kinetic energy, Satellites (Artificial).

Fast magnetic field-line merging at the magnetospheric bow and in the tail are examined to determine their implications in regard to the concept of bulk motion of the magnetosphere (convection) and the associated electric field. Upper atmosphere geophysical measurements are surveyed to determine to what extent the available data support this concept. The dawn-dusk asymmetry in energetic particle fluxes, the movement of auroral ionization, ionospheric currents, and the location of the whistler knee (or 'plasmapause') are all consistent with this concept, the latter three all giving estimates of the electrostatic potential difference across the magnetosphere in the dawn-dusk meridian of a few tens of kilovolts. A 'present best estimate' of the flow pattern in the magnetosphere is derived, based primarily on the diurnal variation in the location of the whistler knee. The convective flow in from the tail appears to be stronger before midnight than after, which is consistent with the location of the maximum nighttime precipitation of energetic electrons. The derived flow is also qualitatively in agreement with that deduced from field-line merging. However, the Axford-Hines types of viscous drag will also give rise to convective flow, and the currently available data do not allow a definitive determination of whether field-line merging or viscous interaction is the principal driving force. (Author)
AD-669 681 Not available from CFSTI.

AIR DENSITY AT HEIGHTS NEAR 190 km IN 1966-7, FROM THE ORBIT OF SECOR 6.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
D. G. King-Hele, and Janice Hingston. Nov 67, 33p Rept no. RAE-TR-67285

Descriptors: (*Upper atmosphere, Barometric pressure), (*Solar disturbances, Density), Scientific satellites, Solar flares, Periodic variations, Diurnal variations, High altitude, Data processing systems, Correlation techniques, Great Britain.
Identifiers: SECOR 6 Satellite.

The air density at a height of 191 km between 14 June 1966 and 5 July 1967 has been evaluated by analyzing the orbit of the satellite Secor 6 (1966-51B). The 154 values of density obtained show that nearly all geomagnetic disturbances are accompanied by increases in density, of larger magnitude than expected. Surprisingly, however, the strong 27-day recurrence tendencies in solar activity, as represented by the 10.7-cm radiation energy, are quite absent from the density variations. When the effect of the day-to-night variation is removed, the most important variation in air density at 191 km during 1966-7 is found to be a semi-annual oscillation, with the maximum density, in October 1966 and April 1967, exceeding the minimum, in July 1966 and January 1967, by a factor of 1.45. This semi-annual variation, which is very similar in form to that found at a height of 1130 km from Echo 2, has during 1966-7 displaced solar activity as the main source of atmospheric variation at heights near 200 km. (Author)
AD-669 697 HC$3.00 MF$0.65

PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1966 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART I. ATMOSPHERIC SCIENCES,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
D. W. Pearce, and M. R. Compton. Oct 67, 105p
Contract AT (45-1)-1830

Descriptors: (*Atmosphere, *Nuclear radiation), Diffusion, Atmospheric precipitation, Tracer studies, Wind, Air pollution, Radiological contamination, Cosmic rays, Neutron activation, Radioactive fallout.

For abstract, see NSA 22 10.
BNWL-481-1-Vol-2-Pt-1 HC$3.00 MF$0.65

PHASE AND GROUP REFRACTIVE INDICES FROM THE COLLISIONLESS MAGNETOIONIC THEORY.
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
K.-L. Chan, L. Colin, and J. G. Lee. Apr 68, 130p
NASA-TM-X-1553
Contract 188-39-01-01-00-21

Descriptors: *Collisionless plasmas, *Electron density profiles, *Graphs (charts), *Isis satellites, Alouette satellites, Explorer satellites, Ionospheric sounding, Magnetic fields, Magnetosphere, Refractivity.

For abstract, see STAR 06 12.
N68-21904 HC$3.00

AURORAL PARTICLES - A REVIEW.
Kiruna Geophysical Observatory (Sweden).
B. Hultqvist. Sep 67, 39p KGO-675
Conf- Presented At the Birkeland Symp., Sandefjord, Norway, Sep. 1967

Descriptors: *Auroral zones, *Electron precipitation, *Protons, Auroral ionization, Backscattering, Bibliographies, Energy spectra, Magnetic disturbances, Particle acceleration, Proton flux density, Upper atmosphere.

For abstract, see STAR 06 12.
N68-22093 HC$3.00 MF$0.65

Group 4A—Atmospheric physics

CURRENT PROGRAM AND CONSIDERATIONS OF THE FUTURE FOR EARTH RESOURCES SURVEY.
National Aeronautics and Space Administration, Washington, D. C.
H. E. Newell. 16 Apr 68, 17p
Conf- Presented At 5th Symp. on Remote Sensing of Environment, Ann Arbor, Mich., 16 Apr. 1968

Descriptors: *Earth planetary structure, *Geodetic satellites, *Meteorological satellites, *Satellite networks, Agriculture, Data systems, Forests, Geography, Geology, Hydrology, Oceanography, Resources.

For abstract, see STAR 06 12.
N68-22261 HC$3.00 MF$0.65

SOLAR-TERRESTRIAL PHYSICS - A GLOSSARY OF TERMS AND ABBREVIATIONS.
Royal Aircraft Establishment, Farnborough (England).
For primary bibliographic entry see Field 3B.
For abstract, see STAR 06 12.
N68-22279 HC$3.00 MF$0.65

ADMITTANCE OF THE INFINITE CYLINDRICAL ANTENNA IN A LOSSY PLASMA. 3 - THE COMPRESSIBLE, MAGNETOPLASMA.
Michigan Univ., Ann Arbor. High Altitude Engineering Lab.
For primary bibliographic entry see Field 9F.
For abstract, see STAR 06 12.
N68-22321 HC$3.00 MF$0.65

ENVIRONMENT MODIFICATION EXPERIMENTS IN SPACE.
Maryland Univ., College Park. the Inst. for Fluid Dynamics and Applied Mathematics.
Mar 68, 219p NASA-CR-94330
Grant NSG-220-62

Descriptors: *Earth atmosphere, *Experimental design, *Magnetosphere, *Mission planning, *Radiation belts, *Space environment simulation, Auroras, Electric fields, Electromagnetic radiation, Electron beams, Ion beams, Magnetic fields, Particle interactions, Plasma clouds, Radiation sources, Saturn launch vehicles, Spacecraft power supplies, Spacecraft propulsion, Wave generation.

For abstract, see STAR 06 12.
N68-22402 HC$3.00 MF$0.65

SCATTERING OF LIGHT IN A TURBID MEDIUM.
Scientific Translation Service, La Canada, Calif.
K. S. Shifrin. Apr 68, 217p NASA-TT-F-477
Contract NASW-1496
Coll- 217 P Refs Tran- Transl. Into English of the Book "rasseyaniye Sveta V Mutnoy Srede" Moscow, Gosgeoltekhizdat., 1951 P 1-212

Descriptors: *Absorption cross sections, *Atmospheric scattering, *Light scattering, *Plasma-particle interactions, *Turbidity, Absorptivity, Atmospheric attenuation, Bibliographies, Clouds (meteorology), Electrical properties, Electromagnetic scattering, Numerical analysis, Perturbation theory, Rainbows, Reflectance, Tables (data).

For abstract, see STAR 06 12.
N68-22462 HC$3.00

RADIATIVE EQUILIBRIUM IN AN ATMOSPHERE WITH CONSTANT EINSTEIN ABSORPTION COEFFICIENT.
National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.
S. Schwartz, and R. Wildt. May 68, 51p NASA-TN-D-4479
Contract 039-52-01-01-51

Descriptors: *Einstein equations, *Gray gas, *Radiation absorption, *Thermodynamic equilibrium, Absorptivity, Approximation, Cartesian coordinates, Emission, Kirchhoff law of radiation, Monochromatic radiation, Photon beams.

For abstract, see STAR 06 12.
N68-22861 HC$3.00 MF$0.65

EXPERIMENTAL APPROACHES TO REMOTE ATMOSPHERIC PROBING IN THE INFRARED FROM SATELLITES.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
W. R. Bandeen. May 68, 54p NASA-TM-X-63188, X-622-68-146

Descriptors: *Atmospheric attenuation, *Infrared instruments, *Radiometers, *Satellite instruments, Absorption spectra, Bibliographies, Explorer 7 satellite, Nimbus satellites, Sounding, Tiros satellites.

For abstract, see STAR 06 12.
N68-22924 HC$3.00 MF$0.65

EQUILIBRIUM SPECTRA OF SECONDARY COSMIC-RAY POSITRONS IN THE GALAXY AND THE SPECTRUM OF COSMIC-GAMMA-RAYS RESULTING FROM THEIR ANNIHILATION.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
For primary bibliographic entry see Field 3B.
For abstract, see STAR 06 12.
N68-22925 HC$3.00 MF$0.65

NOTES ON THE THEORETICAL BASIS OF THE EQUATIONS FOR THE ATMOSPHERE'S SURFACE LAYER.
Technical memo.
Atmospheric Turbulence and Diffusion Lab., Oak Ridge, Tenn.
Nov 67, 54p IERTM-ATDL-7

Descriptors: (*Atmosphere, Surface properties), Thermal analysis, Atmospheric temperature, Barometric pressure, Fluids, Compressive properties, Equilibrium, Differential equations, Equations of motion, Special functions (Mathematical), Atmospheric motion, Mathematical analysis.
Identifiers: Vertical gradients.

A meeting was held on July 7-8, 1966, at the Atmospheric Turbulence and Diffusion Laboratory, ESSA, in Oak Ridge, Tennessee, to discuss the theoretical basis of the equations for the mean wind and temperature profiles in the atmosphere's surface layer.
PB-177 327 HC$3.00 MF$0.65

FURTHER DEVELOPMENT OF ULTRAVIOLET DOSIMETRY BY PLASTICS.
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
For primary bibliographic entry see Field 17E.
PB-177 734 HC$3.00 MF$0.65

4B. Meteorology

RADAR METHOD OF DETERMINING THE PHASE STATE OF CLOUDS AND PRECIPITATION (RADIOLOKATSIONNYI METOD OPREDELENIYA FAZOVOGO SOSTOYANIYA OBLAKOV I OSADKOV),
American Meteorological Society Boston Mass
V. E. Minervin, and A. B. Shupyatskii. Jan 66, 33p Rept no. T-R-519
Contract AF 19 (628)-3880
Trans. of Tsentralnaya Aerologicheskaya Observatoriya. Trudy (USSR) n47 p63-84 1963, by William J. Grimes.

Descriptors: (*Clouds, USSR), Meteorological radar, Phase studies, Scattering, Particles, Atmospheric precipitation, Distribution, Polarization, Radio waves, Errors, Weather forecasting, Radar antennas, Intensity, Radar echo areas, Detection, Mathematical analysis, Tables.
Identifiers: Translations.

A method of determining the phase state of clouds and precipitation based on the relation of the polarization properties of scattering particles to their shape is described. The method of observation, the analysis of the observations, and the errors of the method are discussed. Several examples are given of the observation of the distribution of the phase state of cloud and precipitation particles as a function of time and space. The experimental data are compared with data of aircraft and radar soundings and conclusions are drawn on the possibilities and promise of the method. (Author)
AD-669 179 HC$3.00 MF$0.65

RADAR CHARACTERISTICS OF CLOUDS AS A FUNCTION OF THEIR EDDY AND ELECTRIC STATE (SVYAZ RADIOLOKATSIONNYKH KHARAKTERISTIK OBLAKOV S IKH TURBULENTNYM I ELEKTRICHESKIM SOSTOYANEM),
American Meteorological Society Boston Mass
S. B. Gashina, I. M. Imyanitov, I. I. Kamaldina, E. M. Salman, and E. V. Chubarina. Oct 65, 12p Rept no. T-R-528
Contract AF 19 (628)-3880
Trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n173 p58-62 1965, by Stuart W. Kellogg.

Descriptors: (*Clouds, USSR), Meteorological radar, Electric fields, Turbulence, Reflectivity, Charged particles, Radar reflections, Intensity, Thunderstorms, Convection (Atmospheric), Electrical properties, Aircraft, Damage.
Identifiers: Translations.

The radar reflectivity is examined in relation to the turbulent and electric state of various types of clouds. The mean statistical data are analyzed. It is shown that the magnitude of the reflectivity of convective clouds can be used as an indirect criterion of the degree of turbulence and the thunderstorm danger of the cloud. (Author)
AD-669 180 HC$3.00 MF$0.65

THE AUREOLE PART OF THE SCATTERING INDEX IN THE ATMOSPHERIC SURFACE BOUNDARY LAYER (OREOLNAYA CHAST INDIKATRISY RASSEYANIYA V PRIZEMNOM SLOE VOZDUKHA),
American Meteorological Society Boston Mass
Yu. S. Lyubovtseva, and G. V. Rozenberg. Jun 66, 20p Rept no. T-R-631
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk SSSR. Izvestiya. Fizika Atmosfery i Okeana, v2 n3 p248-62 1966, by Stuart A. /Kellogg.

Descriptors: (*Fog, USSR), (*Atmosphere, Scattering), Light transmission, Boundary layer, Surface properties, Brightness, Optical properties, Haze, Measurement, Particles, Distribution.
Identifiers: Translations, Spring (Season).

The chief results of measurements of the scattering index in the atmospheric surface boundary layer are presented for scattering angles from 10 min to 10 degrees in various regions of the spectrum. It is established that there are three qualitatively different optical states of the atmosphere: haze, mist, and fog. The processes of development and dispersal of fog are traced. (Author)
AD-669 190 HC$3.00 MF$0.65

A CATALOGUE OF METEOROLOGICAL DATA OBTAINED DURING THE LINE ISLANDS EXPERIMENT FEBRUARY-APRIL 1967,
Technical note,
National Center for Atmospheric Research Boulder Colo
Edward J. Zipser, and Ronald C. Taylor. Jan 68, 365p Rept no. NCAR-TN-35
Prepared in cooperation with Hawaii Inst. of Geophysics (Honolulu) report no. HIC-67-19.

Descriptors: (*Meteorological parameters, Catalogs), (*Climatology, Pacific Ocean Islands), (*Reconnaissance satellites, *Aerial photography), Clouds, Oceanographic data, Surface temperatures, Weather forecasting, Radiosondes, Sea water, Rainfall, Accuracy, Upper atmosphere, Wind, Oceanographic vessels, Aircraft, Weather stations, Barometric pressure, Islands, Tropical regions, Maps, Navigation charts, Aerial photographs, Nuclear explosions.
Identifiers: ATS-1 satellite, Line Islands, Surveyor oceanographic vessel, Weather Ship 2 oceanographic vessel.

The goals of the Line Islands Experiment can be placed into three broad categories: To provide a data sample for basic observational studies of meteorological phenomena in the oceanic portion of the Equatorial Trough Zone. To be sure, the Trough Zone has not gone unobserved in the past; some oceanographic data exist, some surface and upper-air data exist, and some satellite observations exist. However, all these data have the crucial deficiency that they are uncorrelated, and/or that much of the atmospheric data comes from the vicinity of large islands or continents -- introducing complicating effects that, in the primitive state of our knowledge, are difficult to account for. The Line Islands program has provided the first comprehensive data sample in the oceanic Equatorial Trough Zone -- far from continents or significantly large islands -- that combines adequate satellite and meteorological data for a variety of basic studies. To provide a meteorological data sample with which to evaluate comprehensively cloud photography performed by the ATS-1 synchronous satellite. To serve as a pilot program for more extensive tropical meteorological experiments. (Author)
AD-669 284 HC$3.00 MF$0.65

THE EASTERN ARCTIC ICE SEASONAL OUTLOOK.
Naval Oceanographic Office Washington D C
For primary bibliographic entry see Field 8L.
AD-669 302 MF$0.65

RESEARCH IN NUMERICAL, DYNAMICAL, AND OPERATIONAL WEATHER FORECAST PROCEDURES.
Final rept. 15 Jan 66-14 Mar 67,
Research Triangle Inst Durham N C
Fred M. Vukovich, and Chi F. Chow. 14 Apr 68, 99p Rept no. RTI-GU-258
AFCRL-68-0206
Contract AF 19 (628)-5834

Descriptors: (*Air force operations, Weather forecasting), Heat transfer, Meteorological charts, Atmosphere models, Atmospheric temperature, Barometric pressure, Lapse rate, Accuracy, Vortices, Cyclones, Anticyclones, Stability.
Identifiers: Diabatic heating, Advection (Atmospheric).

An analysis of various numerical prediction errors of the Global Weather Center, six-level model was performed. The most persistent errors in 12-hour vertical motions ranged between plus or minus 40 mbs at 850 mbs and plus or minus 25 mbs at 500 mbs. Up to 50% of this error was accounted for by slight changes in stability; and diabatic heating produced 12-hour vertical displacements of the same order of magnitude as the error. A case study of the effect of the omission of vertical advection term in the vorticity equation showed that the most significant contribution of this term was in the form of cyclonic vorticity, and that these contributions fell in regions where anticyclonic vorticity was overestimated, reducing this error by as much as 45%. However, a scatter plot of the vorticity error versus the vertical advection term showed a preponderance of cyclonic contribution by vertical advection but these fell equally well in regions where cyclonic and anticyclonic vorticity were overestimated. There was a strong correlation between heating and cooling distribution and surface flow patterns. The height errors also correlated with the heating distribution. It was shown that latent and surface heating accounted for a major portion of the positive height error. (Author)
AD-669 332 HC$3.00 MF$0.65

A CLIMATOLOGICAL GUIDE TO ALASKAN WEATHER,
Weather Squadron (11th) Elmendorf AFB Alaska
Billie E. Grubbs, and Rufus D. McCollum, Jr.
May 68, 97p*

Descriptors: (*Climatology, *Alaska), Weather, Terrain, Weather stations, Military facilities, Distribution, Fluid flow, Atmospheric precipitation, Snow, Mountains, Fog, Visibility, Cloud cover, Wind, Atmospheric temperature, Humidity, Seacoast, Arctic regions, Bering Sea, Aleutian Islands.
Identifiers: Summer (Season), Winter (Season).

The paper was designed to provide a climatological guide to Alaskan weather. As such, it defines five climatic regions within Alaska and describes the conditions which combine to produce the observed regional climates. It is not intended to be a forecasting manual or a detailed analysis of weather factors or terrain peculiarities affecting specific locations. Enough information is included, however, for squadron or detachment personnel to prepare complete seasonal climatological briefings on any general area within Alaska. (Author)
AD-669 344 HC$3.00 MF$0.65

METEOROLOGICAL ROCKET DATA AND PREDICTING THE ONSET OF THE SOUTHWEST MONSOON OVER INDIA AND SOUTHEAST ASIA.
Technical note,
Environmental Technical Applications Center (Air Force) Washington D C
Edward V. von Gahren. May 68, 16p Rept no. ETAC-TN-68-2

Descriptors: (*Meteorological instruments, Weather forecasting), (*Sounding rockets, *Upper atmosphere), Wind, Predictions, Stratosphere, Correlation techniques, Radiosondes, Mesosphere, Periodic variations, Seacoast, Tropical regions, Vietnam, India.
Identifiers: Monsoons, South Vietnam.

Recent independent results from several sources encourage the further consideration of highly probable correlations between the time of the onset of the southwest monsoon over southern South Vietnam, the advance of the southwest monsoon up the west coast of India, and stratospheric and mesospheric dynamics. This paper discusses these independent results, expresses the author's observations on the topic, and shows that an interrelationship or correlation exists between the southwest monsoon and the stratospheric circulation. This information is presented as an example of the value of synoptic meteorological rocket network data. (Author)
AD-669 364 HC$3.00 MF$0.65

OBJECTIVE METHOD TO FORECAST GUSTY SURFACE WINDS AT MACTAN AB, PHILIPPINES.
Meteorological rept. (Final).
Weather Wing (1st) San Francisco Calif 96553 Scientific Services
May 68, 13p
1WW-Technical Study-18

Descriptors: (*Military facilities, Weather forecasting), (*Meteorological parameters, Philippines), Wind, Surface properties, Gusts, Measurement, Weather stations, Anemometers, Runways, Diurnal variations, Intensity, Tables, Velocity, Periodic variations.

The relationship between the maximum surface wind gusts and the maximum wind speed in the lowest 10,000 feet is used to develop an objective technique to forecast surface wind gusts equal to or exceeding 20 knots at Mactan Air Base. Considering only the days when gusty surface winds are likely, the dependent sample shows 73% correct forecasts and a Heidke skill score of 0.46. The corresponding figures for the independent data are 69% and 0.39. (Author)
AD-669 366 HC$3.00 MF$0.65

IRIG STANDARDS FOR RANGE METEOROLOGICAL DATA REDUCTION. PART I. RAWINSONDE.
Inter-Range Instrumentation Group White Sands Missile Range N Mex Meteorological Working Group
Aug 67, 80p Rept no. IRIG-MWG-108-67-Pt-1

Descriptors: (*Guided missile ranges, Meteorological parameters), (*Meteorological parameters, *Data processing systems), Standardization, Sounding rockets, Radiosondes, Data storage systems, Atmospheric sounding, Programming (Computers), Wind, Flow charting, Input-output devices, Subroutines, Upper atmosphere, Humidity, Velocity, Atmospheric temperature, Refractive index, Barometric pressure, Density, Altitude, Tables, New Mexico.
Identifiers: Graphs (Charts).

The measurement of atmospheric parameters to support activities on National and Service ranges involves the entire meteorological environment from the most simple observation of data near the surface to the complex and difficult measurements of high altitude parameters by the use of rocket and satellite-borne instrumentation. The specific techniques used for the reduction of meteorological data varies between ranges because the methods have evolved from individual efforts. In an attempt to alleviate this problem and with the additional goal of producing the best possible data, the Meteorological Working Group of the Inter-Range Instrumentation Group proposed the task of standardizing the methods used in the reduction of range meteorological data. (Author)
AD-669 393 HC$3.00 MF$0.65

BIBLIOGRAPHY ON THE CLIMATE OF ANGOLA,
Weather Bureau Washington D C
Darthula M. Carraway. 17 Dec 56, 26p Rept no. WB/BC-8

Descriptors: (*Climatology, Angola), Bibliographies, Meteorology, Reports, Meteorological parameters, Abstracts, Periodic variations, Diurnal variations, Micrometeorology, Statistical analysis, Meteorological balloons, Tropical regions, Maps, Atmospheric precipitation, Air mass analysis, Clouds, Meteorological phenomena.
Identifiers: Translations.
AD-669 410 HC$3.00 MF$0.65

BIBLIOGRAPHY OF THE CLIMATE OF COLOMBIA.
Weather Bureau Washington D C
1953, 21p Rept no. WB/BC-13

Descriptors: (*Climatology, Bibliographies), Abstracts, Wind, Periodic variations, Weather forecasting, Atmospheric precipitation, Diurnal variations, Weather stations, Micrometeorology, Atmospheric temperature, Upper atmosphere, Rainfall, Humidity, Evaporation, Distribution, Reports, Colombia.

The report is a bibliography on the climate of Colombia, South America. (Author)
AD-669 411 HC$3.00 MF$0.65

BIBLIOGRAPHY ON THE CLIMATE OF NYASALAND, NORTHERN AND SOUTHERN RHODESIA.
Weather Bureau Washington D C
1968, 24p Rept no. WB/BC-19
Availability: Microfiche only after original copies exhausted.

Descriptors: (*Climatology, Subsaharan Africa), Wind, Rainfall, Weather stations, Atmospheric

temperature, Weather forecasting, Atmospheric precipitation, Thunderstorms, Bibliographies.

The bibliography on the climate of Nyasaland, Northern and Southern Rhodesia contains contributions in the areas of rainfall, atmospheric temperature, barometric pressure, storms, and weather forecasting. (Author)
AD-669 412 MF$0.65

AN IMMEDIATE-ACCESS BUFFER (MEMORY UNIT) FOR AN ELECTRONIC COMPUTER (BUFERNOE OPERATIVNOE ZAPOMINAYUSHCHEE USTROISTVO DLYA ELEKTRONNOI VYCHISLITELNOI MASHINY),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9B.
AD-669 419 HC$3.00 MF$0.65

A THEORETICAL TREATMENT OF MIXED SMOKES AS ICE NUCLEI,
Naval Ammunition Depot Crane Ind
Duane M. Johnson. 16 Apr 68, 35p Rept no. NAD-CR-RDTR-112

Descriptors: (*Artificial precipitation, Pyrotechnics), Nucleation, Smoke generators, Supercooling, Brownian motion, Chemical reactions, Salts, Potassium compounds, Silver compounds, Iodides, Ice fog.

A proposed nucleation mechanism is described for mixed smokes composed of potassium iodide and silver iodide. The dynamic dissolution of such smoke particles is considered to be theoretically of significance in the nucleation mechanism of supercooled fogs of water droplets. (Author)
AD-669 435 HC$3.00 MF$0.65

LIMIT GAGES FOR MEASURING WIND VELOCITIES.
Technical rept. Sep 66-Dec 67,
Naval Civil Engineering Lab Port Hueneme Calif
P. J. Rush, and R. L. George. May 68, 30p Rept no. NCEL-TR-579

Descriptors: (*Wind, Measurement), Velocity, Tropical cyclones, Anemometers, Conical bodies, Aerodynamic configurations, Manometers, Distribution, Calibration, Damage, Analysis, Design, Test facilities.
Identifiers: Limit gages.

Field studies assessing the damage caused by hurricane-force winds have revealed a need for simple methods to determine wind velocities causing structural damage. Development of limit wind gage concepts is described. Two concepts, (1) aerodynamic cones in arrays and (2) omnidirectional venturi with recording manometer, provided consistent airstream velocity readings in wind tunnel tests. It is recommended that units of the aerodynamic cone arrays and of the omnidirectional venturi devices be installed for evaluation at several sites where recording anemometers are available and high winds have been experienced. (Author)
AD-669 455 HC$3.00 MF$0.65

DURATION OF COLD TEMPERATURE OVER NORTH AMERICA,
Environmental research papers no. 286,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Paul I. Tattelman. Apr 68, 31p Rept no. AFCRL-68-0232

Descriptors: (*Atmospheric temperature, Periodic variations), Cold weather tests, Weather stations, Ice, Weather forecasting, Diurnal variations, Meteorological charts, Distribution, Canada, Alaska, United States.
Identifiers: Winter (Season).

The duration of temperature as low as -60F over North America is presented. Data from 106 stations across the United States and Canada were tabulated to provide the longest period of temperature at or below eight 'threshold' temperatures in ten years. Also depicted are expected (approximately 50 percent probability) duration of six 'threshold' temperatures during any single winter season. Durations at or below -60F have exceeded 48 hours in the Yukon, but the longest duration of -40F over the contiguous United States was only two hours along the Canadian border of North Dakota. (Author)
AD-669 567 HC$3.00 MF$0.65

ESTIMATING THE DATE OF RETREAT OF THE RAINY SEASON IN SOUTHERN SOUTH VIETNAM.
Air Force Surveys in geophysics no. 204,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Iver A. Lund, and Donald D. Grantham. Apr 68, 25p Rept no. AFCRL-68-0229

Descriptors: (*Rainfall, *Vietnam), Weather forecasting, Distribution, Predictions, Wind, Reliability, Atmospheric precipitation, Regression analysis, Periodic variations, Pacific Ocean.
Identifiers: Monsoon, South Vietnam.

Eight years of 100-mb geopotential height observations, taken over most of Asia and the western North Pacific Ocean, were searched to uncover predictors of the time of retreat of rainy seasons. Statistically significant predictors were found and two prediction equations were derived and tested on one year of independent data. Evidence shows that skillful predictions of the date of retreat of rainy seasons can be prepared several weeks in advance. More data are required to test the reliability of this evidence. (Author)
AD-669 569 HC$3.00 MF$0.65

ENVIRONMENTAL DATA BASE FOR REGIONAL STUDIES IN THE HUMID TROPICS.
Monthly microclimatic summary, Sep 67,
Army Tropic Test Center Fort Clayton Canal Zone
Michael A. Fradel, and Wilfried H. Portig. Apr 68, 27p
ARPA Order-740

Descriptors: (*Climatology, Panama), Site selection, Instrumentation, Atmospheric temperature, Wind, Barometric pressure, Atmospheric precipitation, Humidity, Evaporation, Velocity, Periodic variations, Air pollution, Micrometeorology, Diurnal variations, Tropical regions, Soils, Plants (Botany), Tropical regions.

The report contains detailed microclimatic data for September 1967 from specific sites in the Panama Canal Zone and vicinity. The data are presented in tabular form, summarized for hourly and/or daily observations from surface to 46-meter levels. Elements listed are: temperature, pressure, precipitation, wind speed and direction, relative humidity, and evaporation. (Author)
AD-669 594 HC$3.00 MF$0.65

ENVIRONMENTAL DATA BASE FOR REGIONAL STUDIES IN THE HUMID TROPICS.
Monthly microclimatic summary rept.,
Army Tropic Test Center Fort Clayton Canal Zone
Michael A. Fradel, and Wilfried H. Portig. Oct 67, 26p
ARPA Order-740

Descriptors: (*Climatology, Tropical regions), (*Tropical tests, Meteorological parameters), Site selection, Micrometeorology, Instrumentation, Atmospheric temperature,. Barometric pressure, Atmospheric precipitation, Humidity, Wind, Velocity, Evaporation, Periodic variations, Air pollution, Soils, Plants (Botany), Trees, Distribution, Panama.

The report contains detailed microclimatic data for October 1967 from specific sites in the Panama Canal Zone and vicinity. The data are presented in tabular form, summarized for hourly and/or daily observations from surface to 46-meter levels. Elements listed are: temperature, pressure, precipitation, wind speed and direction, relative humidity, and evaporation. (Author)
AD-669 603 HC$3.00 MF$0.65

ENVIRONMENTAL DATA BASE FOR REGIONAL STUDIES IN THE HUMID TROPICS.
Monthly Microclimatic summary rept. Nov 67.
Army Tropic Test Center Fort Clayton Canal Zone
Apr 68, 26p
ARPA Order-740
See also AD-667 353.

Descriptors: (*Climatology, Tropical regions), (*Tropical tests, Meteorological parameters), Atmospheric temperature, Micrometeorology, Site selection, Barometric pressure, Atmospheric precipitation, Wind, Velocity, Distribution, Evaporation, Instrumentation, Humidity, Soils, Periodic variations, Air pollution, Plants (Botany), Trees, Diurnal variations, Panama.

The report contains detailed microclimatic data for November 1967 from specific sites in the Panama Canal Zone and vicinity. The data are presented in tabular form, summarized for hourly and/or daily observations from surface to 46-meter levels. Elements listed are: temperature, pressure, precipitation, wind speed and direction, relative humidity, and evaporation. (Author)
AD-669 604 HC$3.00 MF$0.65

THE POWER SPECTRUM IN THE ATMOSPHERE BELOW MACROSCALE.
University of St Thomas Houston Tex Inst for Storm Research
For primary bibliographic entry see Field 4A.
AD-669 678 HC$3.00 MF$0.65

PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1966 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART I. ATMOSPHERIC SCIENCES,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 4A.
For abstract, see NSA 22 10.
BNWL-481-1-Vol-2-Pt-1 HC$3.00 MF$0.65

METEOROLOGICAL DATA. VOLUME 74, NO. 1 - HIGHEST AND LOWEST VALUES OF ATMOSPHERIC PRESSURE AT GROUND-LEVEL, NORTH ATLANTIC REGION, 1931-1965.
Meteorologische Abhandlungen. Band 74, Heft No. 1 - Hoechste Und Tiefste Werte des Bodenluftdruckes Im Nordatlantischen Raume, 1931 Bis 1965
Freie Univ., Berlin (West Germany). Institut Fuer Meteorologie Und Geophysik.
H. Wieder. 1967, 56p
Lang- in German, English Summary

Descriptors: *Annual variations, *Atmospheric pressure, *Meteorology, Anticyclones, Cyclones, Tables (data).

For abstract, see STAR 06 12.
N68-22969 HC$3.00 MF$0.65

METEOROLOGICAL DATA. VOLUME 62, NO. 3 - AEROLOGY REPORTS ON THE STRATOSPHERE OVER BERLIN, 1966 QUARTERLY REPORT, JUL. - SEP. 1966.
Meteorologische Abhandlungen. Band 62, No. 3 - Beitraege Zur Aerologie Der Stratosphaere Ueber Berlin Im Jahre 1966, Teil 3 Vierteljahr, Jul. - Sep. 1966

Freie Univ., Berlin (West Germany). Institut Fuer Meteorologie Und Geophysik.
E. Maedlow, and E. Pantzke. 1967, 47p QR-3 Lang- in German, English Summary Spon- Supported in Part By Ger. Res. Organ.

Descriptors: *Aerology, *Germany, *Stratopause, *Wind (meteorology), Climatology, Diurnal variations, Meridional flow, Temperature distribution, Wind measurement.

For abstract, see STAR 06 12.
N68-22977 HC$3.00

HISTORICAL AND CLIMATOLOGICAL STUDY OF GRINNELL GLACIER, MONTANA.
Weather Bureau, Salt Lake City, Utah. Western Region.
For primary bibliographic entry see Field 8K.
PB-178 071 HC$3.00 MF$0.65

THUNDERSTORM RESISTANCE CHARACTERISTICS OF 35 TO 500 KV ELECTRIC POWER TRANSMISSION LINES (KHARAKTERISTIKI GROZOUPORNOSTI VOZDUSHNYKH LINII ELEKTROPEREDACHI 35-500KV),
Bonneville Power Administration, Portland, Oreg.
For primary bibliographic entry see Field 9A.
PB-178 164T HC$3.00 MF$0.65

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

FOR SCIENCE THERE ARE NO BOUNDS (DYLA NAUKI NET PERIFERII),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 5I.
AD-669 297 HC$3.00 MF$0.65

INNOVATION IN LIQUID PROPELLANT ROCKET TECHNOLOGY.
Office of Research Analyses Holloman AFB N Mex
For primary bibliographic entry see Field 21H.
AD-669 334 HC$3.00 MF$0.65

DEFENSE PLANNING AND BUDGETING: THE ISSUE OF CENTRALIZED CONTROL,
Rand Corp Santa Monica Calif
James R. Schlesinger. May 68, 68p Rept no. P-3813

Descriptors: (*Department of Defense, Management planning), Decision making, Cost effectiveness, Federal budgets, Armed forces (United States), Armed forces research, Management control systems.

Discusses changes in Department of Defense planning since 1961.
AD-669 337 HC$3.00 MF$0.65

LONG-RANGE PLANNING THROUGH PROGRAM BUDGETING,
Rand Corp Santa Monica Calif
David Novick. May 68, 14p Rept no. P-3850

Descriptors: (*Management planning, *Budgets), Advanced planning, Decision making, Costs, Department of Defense, Effectiveness.
Identifiers: *Program budgeting, PPBS (Planning Programming Budgeting System), Planning programming budgeting systems.

Program Budgeting--or the Planning-Programming-Budgeting Systems abbreviated as PPB--focuses on the basic function of management, which is to use the organization's available resources in the way that will be most effective in meeting its goals. Basically, the PPB system contributes to the planning process in two ways. First, it establishes and makes explicit the relationships, or linkages, among the organization's objectives, its programs and activities, the resource implications of those activities, and their financial expression in a budget. In so doing, it provides much of the information needed for rational planning in an easily usable form. Second, PPB contributes directly to management decisionmaking by providing analyses of the consequences, in terms of estimated costs and expected benefits, of possible program decisions. (Author)
AD-669 459 HC$3.00 MF$0.65

FIRST-ORDER CERTAINTY EQUIVALENCE.
California Univ Berkeley Center for Research in Management Science
For primary bibliographic entry see Field 12B.
AD-669 465 HC$3.00 MF$0.65

PUBLIC POLICY RESEARCH AND ADMINISTRATION: A PROPOSAL FOR EDUCATIONAL INNOVATION,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5I.
AD-669 559 HC$3.00 MF$0.65

EXPLORATION OF ORAL/INFORMAL TECHNICAL COMMUNICATIONS BEHAVIOR.
American Institutes for Research Silver Spring Md
For primary bibliographic entry see Field 5B.
AD-669 586 HC$3.00 MF$0.65

PUNCHED CARD PRESCRIPTION ANALYSIS AND COST ACCOUNTING OF PHARMACIES,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 6O.
JPRS-44354 HC$3.00 MF$0.65

PEOPLE'S CONTROL GROUPS IN SOVIET SCIENTIFIC INSTITUTIONS,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 5K.
JPRS-44616 HC$3.00 MF$0.65

A STUDY TO DEVELOP AN ACTION PLAN FOR THE ECONOMIC AND INDUSTRIAL DEVELOPMENT OF RHODE ISLAND.
Marcom, Inc., New York.
Feb 68, 192p*
EDA-7-35207

Descriptors: (*Urban areas, *Management planning), (*Economics, Industrial production), Manpower studies, Population, Industries, Mobilization, Job analysis, Employment, Site selection, Statistical analysis, Recreation, Natural resources, Environment, Advanced planning, United States, Rhode Island.
Identifiers: Tourism.

This study had two primary objectives: to identify economic development action programs for Rhode Island; and to describe possible mechanisms for planning and program implementation. The scope of the work concerned all aspects of industrial and economic development and the study was designed to examine trends; patterns of change and the forces which could have impact on Rhode Island's future growth. A broad analysis and evaluation of the economy and of the factors which appear to be shaping it form the basis for a set of recommendations covering both general and specific action programs. These recommendations are characterized by requirements for integrated efforts at state, local and private levels and point to the desirability of revisions in the approaches to state planning and development. (Author)
PB-177 761 HC$3.00 MF$0.65

AN EXPLORATORY STUDY OF DOMESTICS' VIEW OF THEIR WORKING WORLD. AN INQUIRY INTO THE METHODOLOGY OF A RESEARCH DESIGN FORMULATED TO GATHER INFORMATION FOR A MORE EXTENSIVE INVESTIGATION,
New York Univ., N. Y. School of Education.
Jeanne L. Noble. Dec 67, 254p
Grant DL-91-34-67-06

Descriptors: (*Management planning, *Sociology), Feasibility studies, Training, Sampling, Maintenance personnel, Females, Employee relations, Social psychology, Questionnaires, Reaction (Psychology), New York.
Identifiers: Harlem (New York City).

In keeping with the limited scope of the feasibility study the specific objectives were: (1) To explore various methods of obtaining names and addresses of domestic workers representative of this occupational group living within the Central Harlem area. (2) To establish the best methods of obtaining employee and employer cooperation. (3) To pretest three instruments; (a) an employee interview guide, (b) an employer interview guide, and (c) an observation-participant guide. (4) To present the advantages and disadvantages, including relative costs of each method and investigate and recommend the most appropriate technique to be used in the larger study. (5) To determine on the basis of the above the feasibility of a larger study.
PB-177 865 HC$3.00 MF$0.65

ECONOMIC ORGANIZATION PROJECT DRY CLEANING TRADE ASSOCIATION.
Annual rept. 1 Aug 66-31 Jul 67.
Howard Univ., Washington, D. C. Dept. of Business Administration.
Dec 67, 50p
Contract Cc-6182

Descriptors: (*Organizations, *Industries), Culture, Interactions, Management planning, Economics, Motivation, Social communication, Operations research, Questionnaires, Reports.
Identifiers: Dry Cleaning project.

The program, funded by the Economic Development Administration of the U. S. Department of Commerce, was carried out by the Small Business Guidance and Development Center of Howard University. The Center proposed to take one trade, preferably dry cleaners, of which there were at the time at least 124 Negro-owned firms in Washington, D. C. and assist as many as were willing to unite in some kind of homogeneous group for their collective and individual advantage. The purpose of the proposal was to first organize the Negro businessman into a group structure which will allow for greater efficiency of operation through the collective pooling of their assets and talents. At first, considerable time was spent in studying published material and in talking with experienced people on the form the cooperative effort should take and the trade to be involved. Consideration was given to cooperative chains, voluntary chains, and franchising before agreement was reached to organize the dry cleaners of the Metropolitan Washington area into a trade association.
PB-178 006 HC$3.00 MF$0.65

A PROGRAM OF WORK FOR THE MUSCLE SHOALS AREA COUNCIL OF LOCAL GOVERNMENT.
Muscle Shoals Council of Local Governments, Ala.
1967, 69p*
Prepared in cooperation with the Department of Housing and Urban Development, Washington, D. C.

Descriptors: (*Management planning, Alabama), Education, Training, Feasibility studies, Statistical analysis, Budgets, Economics, Government employees, Urban areas, Sanitary engineering, Public health, Law, Costs, Fire safety, Protection, Maps.
Identifiers: Muscle Shoals (Alabama).

The report provides a description of the results of interviews with more than 100 elected officials, department heads, employees of the Council of Local Governments' member governments. The interviews sought to identify areas of common interest and concern both in the operation of the member governments and as they related to the region. This report sets forth a work program of projects, activities and administrative actions in fulfillment of the Council's goals as stated in its Articles of Incorporation. A three-year program implementation schedule including a staffing plan, budget requirements, and suggested sources of funds are included in the report. The interviews revealed fourteen activity areas of interest and concern to the Muscle Shoals area's local officials. (Author)
PB-178 009 HC$3.00 MF$0.65

PLANT REQUIREMENTS FOR MANUFACTURE OF PHARMACEUTICAL PRODUCTS.
International Cooperation Administration, Washington, D. C. Technical Aids Branch.
For primary bibliographic entry see Field 13H.
PB-178 062 HC$3.00 MF$0.65

TRAINING COURSE IN MARKETING.
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.
Mar 60, 97p Technical Bull-61

Descriptors: (*Management planning, *Instruction manuals), (*Commerce, Training), Time, Distribution, Storage, Handling, Training, Money.
Identifiers: Advertising.

Contents: Introduction - important parts of marketing; Marketing research; Pricing policies; Advertising; Channels of distribution; Selling; Storage and warehousing; and Payment.
PB-178 063 HC$3.00 MF$0.65

MANAGEMENT PRIMER: PRINCIPLES AND PRACTICES OF PRODUCTIVITY - RECORDS AND REPORTS.
International Cooperation Administration, Washington, D. C. Technical Aids Branch.
May 62, 53p Training manual-96

Descriptors: (*Management planning, Reports), (*Instruction manuals, Reports), Public opinion, Accuracy, Standardization, Classification, Manpower, Law, Records, Handling, Production, Costs, Money.
Identifiers: Accounting.

Written records are the memory of management. They preserve facts and figures by setting them down in writing for future use. Without records and the experience they preserve there would be no scientific management today. Recorded experience helps management in the planning and scheduling of its operations. By comparing recorded performance with planned performance supervisors can control the progress of enterprise activities. And, by using records to obtain detailed information on all enterprise developments, businessmen can base their decisions on experience and thus reduce the risks of misjudging enterprise strength. Records also protect management against legal difficulties, because they create and preserve evidence on internal and external transactions that may be questioned by the public, by government, by the courts, or by other enterprises. (Author)
PB-178 064 HC$3.00 MF$0.65

ELECTRONIC DATA PROCESSING BRIEF.
Metropolitan Atlanta Council of Local Governments, Ga.
For primary bibliographic entry see Field 9B.
PB-178 066 HC$3.00 MF$0.65

MACLOG SELF-ANALYSIS.
Metropolitan Atlanta Council of Local Governments, Ga.
For primary bibliographic entry see Field 13B.
PB-178 073 HC$3.00 MF$0.65

ALTERNATIVE BUDGETING PROCEDURES FOR COMMUNITY ACTION PROGRAMS.
Baxter, McDonald and Co., Berkeley, Calif.
For primary bibliographic entry see Field 5C.
PB-178 172 HC$3.00 MF$0.65

BUDGETING AND MANAGING COMMUNITY ACTION PROGRAMS.
Baxter, McDonald and Co., Berkeley, Calif.
For primary bibliographic entry see Field 5C.
PB-178 173 HC$3.00 MF$0.65

BUDGETING AND EVALUATING COMMUNITY ACTION PROGRAMS.
Baxter, McDonald and Co., Berkeley, Calif.
For primary bibliographic entry see Field 5C.
PB-178 174 HC$3.00 MF$0.65

5B. Documentation and Information Technology

THE ROLE OF PROJECT HISTORIES IN THE STUDY OF R AND D,
RAND Corp., Santa Monica, Calif.
T. A. Marschak. Jan 64, 128p P-2850

Descriptors: (*Armed Forces research, Reviews), Contracts, Costs, Budgets, Research program administration, Effectiveness, Airborne, Side-looking radar, Warfare, Jet engines, Jet fighters, Jet bombers, Homing devices, Heat homing, Guided missiles (Air-to-air).
Identifiers: Sidewinder.

This Paper is intended to serve several purposes. It makes available in summary form a series of development case histories studied by a number of different investigators. Most of these histories have already been described in various reports and documents that, for one reason or another, are not generally available. As is well known, scholarly investigation of R and D economics and decision making has suffered from a dearth of empirical and comparative materials, particularly data relating to military development projects. Within the limits imposed by security considerations, it is hoped that the present collection of development histories will at least partly fill this gap, and will thereby stimulate economists and other scholars to give increased attention to problems of development strategy. At the same time, this Paper provides a tentative framework for categorizing various R and D strategies, and illustrates some of the limitations as well as the possibilities of the project-history approach.
AD-458 062 HC$3.00

TOWARDS A UNIFORM FEDERAL REPORT NUMBERING SYSTEM AND A CUDDLY MICROFICHE READER, TWO MODEST PROPOSALS,
Air Force Office of Scientific Research Arlington Va Directorate of Information Sciences
Harold Wooster. 7 May 68, 18p
AFOSR-68-0772
Presented at the Annual Northeastern Documentation Center/Industry Users Conference (3rd), Waltham, Mass., 17 Apr 68.

Descriptors: (*Documentation, Standardization), (*Reports, *Numbers), (*Film readers, *Microfiche), Portable, Design, Control systems, Information retrieval.
Identifiers: *Accession numbers.

The paper cites a 20 year old report on the bibliographic control of government reports and questions if any of the problems then posed have in fact been solved. Solutions are proposed to two of these, a uniform Federal report numbering system, and the design of a personal microfiche reader. The report numbering system suggests the use of CODEN for performing and sponsoring agencies; these CODEN to be integral and permanent part of the report number. Also proposed is a system of prime numbering to identify specific reports--a solution almost too brilliant to be taken seriously. It is shown how the design of microfiche readers has been hampered by two factors; the absence of a means for precisely moving the film in controlled increments, and the arrangement of images of the fiche. The paper proposes standard sprocket holes on the fiche and a boustrophedon arrangement of the images. The report culminates with the design of a microfiche reader which would be personal, portable, and cuddly. (Author)
AD-669 204 HC$3.00 MF$0.65

QUARTERLY PROGRESS REPORT NO. 89,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
H. J. Zimmermann, G. G. Harvey, and S. J. Mason. 15 Apr 68, 287p
See also quarterly progress report no. 88, AD-665 731.

Descriptors: (*Physics, Reports), Nuclear magnetic moments, Paramagnetic resonance, Radio astronomy, Nuclear magnetic resonance, Infrared spectroscopy, Cyclotron resonance phenomena, Thermonuclear reactions, Excitation, Microwaves, Argon, Tungsten, Linguistics, Oxidation, Interactions, Molecular beams, Plasma physics, Indium antimonides, Magnetic fields, Information theory, Nervous system.
Identifiers: Electrodynamics, Computer simulation, Acoustic waves, Helicons.

Contents: Atomic resonance and scattering; Electron magnetic resonance; Radio astronomy; Solid-state microwave electronics; Optical and infrared spectroscopy; Geophysical research; Magnetic resonance; Physical electronics and surface physics; Electrodynamics of media; Plasma physics; Gaseous electronics; Plasmas and controlled nuclear fusion; Spontaneous radiofrequency emission from hot-electron plasmas; Interaction of laser radiation with plasmas and nonadiabatic motion of particles in magnetic fields; Processing and transmission of information; Speech communication; Cognitive information processing; Communications biophysics.
AD-669 231 HC$3.00 MF$0.65

STRESS CORROSION CRACKING IN AIRCRAFT STRUCTURAL MATERIALS.
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 11F.
AD-669 282 HC$3.00 MF$0.65

CONFERENCE ON CHINESE DATA RETRIEVAL HELD AT THE RAND CORPORATION, FEBRUARY 2-3, 1968,
Rand Corp Santa Monica Calif
Thomas W. Robinson. May 68, 47p Rept no. P-3842

Descriptors: (*Documentation, China), (*Social sciences, Symposia), Information retrieval, Programming (Computers), Research program administration, Manpower studies, History, Economics, Communism, Periodicals, Bibliographies, Costs, Collecting methods, Data processing systems, Data storage systems, Man-machine systems, Digital computers.

A conference on the usages to which the computer could be put in China studies was held February 2-3, 1968. Those attending included China area specialists, specialists in the computer sciences, and government personnel whose duties included application of computer technology to the social sciences and, in some cases, to China studies. (Author)
AD-669 339 HC$3.00 MF$0.65

PROCEEDINGS OF MILITARY LIBRARIANS WORK SHOP (11TH); 31 OCT-2 NOV 1967. THE USER AND THE LIBRARY.
Air Force Inst of Tech Wright-Patterson AFB Ohio
1967, 59p

Descriptors: (*Libraries, Symposia), Documentation, Military requirements, Technical information centers, Public opinion, Classification, Training, Professional personnel, Predictions, Data processing systems, Reports.

The theme of the Eleventh Military Librarians Workshop was 'The User and the Library.' Each group discussed the same major topics, developing the important points in their own way. On Thursday morning summaries were given to the entire workshop attendants. To provide balanced representation of both users and librarians outside speakers contributed ideas that were discussed in the group meetings. (Author)
AD-669 362 HC$3.00 MF$0.65

NSF ADVANCED SCIENCE SEMINAR IN ROCK MECHANICS FOR COLLEGE TEACHERS OF STRUCTURAL GEOLOGY 26 JUNE - 28 JULY 1967, BOSTON COLLEGE, CHESTNUT HILL, MASS. VOLUME I,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 8G.
AD-669 375 MF$0.65

NSF ADVANCED SCIENCE SEMINAR IN ROCK MECHANICS FOR COLLEGE TEACHERS OF STRUCTURAL GEOLOGY 26 JUNE - 28 JULY 1967, BOSTON COLLEGE, CHESTNUT HILL, MASS. VOLUME II,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 8G.
AD-669 376 MF$0.65

THE STORAGE AND RETRIEVAL OF 'VISUALS',
Office of Aerospace Research Arlington Va Office of Scientific and Technical Information
Walter S. Baker, and Alexander G. Hoshovsky.
Mar 68, 7p
OAR-68-0008
Availability: Published in Graphic Science, v10 n3 p22-7 Mar 1968.

Descriptors: (*Pictures, *Data storage systems), (*Information retrieval, Pictures), Photographs, Graphics, Subject indexing, Abstracts.
Identifiers: Coordinate indexing.

A description is given of a proven approach to a system of retrieval and storage that indexes visuals by using coordinates. (Author)
AD-669 396 Not available from CFSTI.

BIBLIOGRAPHY OF THE CLIMATE OF COLOMBIA.
Weather Bureau Washington D C
For primary bibliographic entry see Field 4B.
AD-669 411 HC$3.00 MF$0.65

MATHEMATICAL ASPECTS OF COMPUTER SCIENCE,
American Mathematical Society Providence R I
For primary bibliographic entry see Field 9B.
AD-669 507 Not available from CFSTI.

INDEX TO THE SHOCK AND VIBRATION BULLETINS,
Shock and Vibration Information Center (Defense) Washington D C
For primary bibliographic entry see Field 20K.
AD-669 509 HC$3.00 MF$0.65

R AND D ABSTRACTS. VOLUME 21 NUMBER 3, 1-15 FEBRUARY 1968.
Ministry of Technology London (England) Technical Information and Library Services
15 Feb 68, 80p
See also AD-668 880.

Descriptors: (*Reports, *Abstracts), Psychology, Biology, Mathematics, Computers, Upper atmosphere, Fluid mechanics, Physics, Electronics, Jet engines, Airplanes, Spacecraft, Metallurgy, Heating, Great Britain.
Identifiers: *Announcement bulletins.
AD-669 583 HC$3.00 MF$0.65

EXPLORATION OF ORAL/INFORMAL TECHNICAL COMMUNICATIONS BEHAVIOR.
Final rept. Aug 66-Aug 67,
American Institutes for Research Silver Spring Md
Warren R. Graham, Clinton B. Wagner, William P. Gloege, and Albert Zavala. Aug 67, 179p Rept no. AIR-F-46-8/67-FR
AROD-6942:2
Contract DAHC04-67-C-0004, ARPA Order-895
Supersedes AD-650 219.

Descriptors: (*Information retrieval, *Management planning), (*Social communication, Scientific personnel), Behavior, Engineering personnel, Management engineering, Decision making, Social psychology, Questionnaires, Motivation, Directories, Reviews.

The report explored and defined the boundaries of informal scientific and technological communication, based on data from scientists and engineers. A major purpose of the report was to determine the kinds of management decisions needed to enhance research productivity by improving informal research communication. The report includes: (1) a survey of current literature on research relating to informal scientific communications; (2) a summation of informal communications problems reported by research managers and their suggestions for improvement; and (3) an analysis of interviews, questionnaires, and critical incident reports supplied from 326 research project directors. Data is reported on: (1) how informal and formal communications are interrelated; (2) how difficult-to-obtain information is located; (3) the values of informal research communications; (4) effects on research motivation and innovation; (5) informational exchanges and newsletters; (6) intra-organization communications; (7) inter-disciplinary communications; (8) directories of specialists; (9) visiting of other laboratories; (10) meetings and conferences; (11) use of communications technology; (12) restrictions on information transfer; and (13) the functions of informal communications in the research process. The evidence produced by the participating research project directors testified to their broadness of perspective, and to the importance that they attach to problems of informal communications. The report substantiates values they place on informal communications to a very high degree. A list of overall problems and recommendations completes the report. (Author)
AD-669 586 HC$3.00 MF$0.65

SEMIANNUAL PROGRESS REPORT NO. 75, COVERING PERIOD JULY 1, 1967 - DECEMBER 31, 1967.
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
For primary bibliographic entry see Field 20N.
AD-669 693 HC$3.00 MF$0.65

CONSTRUCTION OF SEMANTIC TREES FOR TERM DEFINITIONS,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 5G.
JPRS-44774 HC$3.00 MF$0.65

AEROSPACE MEDICINE AND BIOLOGY - A CUMULATIVE INDEX.
National Aeronautics and Space Administration, Washington, D. C.
For primary bibliographic entry see Field 6S.
For abstract, see STAR 06 12.
N68-22194 HC$3.00 MF$0.65

THE ROLE OF LOCATIONAL CONTROL IN AN INFORMATION SYSTEM.
East-West Gateway Coordinating Council, East St. Louis, Ill.
For primary bibliographic entry see Field 13B.
PB-177 623 HC$3.00 MF$0.65

POVERTY AND HEALTH IN THE UNITED STATES. A BIBLIOGRAPHY WITH ABSTRACTS.
Medical and Health Research Association of New York City, N. Y.
1967, 300p*

Descriptors: (*Public health, Bibliographies), (*Economics, Bibliographies), Aging (Physiology), Housing, Density, Sanitary engineering, Urban areas, Nutrition, Diseases, Birth, Mental disorders, Rural areas, Mortality rates, Children, Abstracts, United States.
Identifiers: *Poverty.

The bibliography consists of a compilation of the literature on poverty and health in the United States covering the years, 1960 through 1966. Studies which appraise the health status of the poor, analyze the availability and quality of health services, investigate possible causes and effects of medical deprivation and proposals and programs for improving the health care of the disadvantaged were documented and abstracted. Although most of the citaions are from American publications, selected articles from English language journals of foreign countries were included, where the papers had some bearing upon aspects of health and poverty in the United States. (Author)
PB-177 655 HC$3.00 MF$0.65

TRAFFIC SYSTEMS REVIEWS AND ABSTRACTS: REVIEWS: T-0181 - T-0210.
Research Triangle Inst., Durham, N. C.
Mar 68, 43p*
Contract FH-11-6610

Descriptors: (*Traffic, *Documentation), Roads, Information retrieval, Communication systems, Control systems, Cost effectiveness, Reviews, Abstracts.

This publication is an assembly of Traffic Systems Reviews and Abstracts to be provided monthly by the contractor through May 1968. The main objective of this technical review service is to furnish to Bureau of Public Roads staff, and to others concerned with major highway research and development programs, critical reviews and abstracts of current literature in the topic areas of Traffic Flow Theory, communication and control systems, and cost effectiveness methodology. By highlighting significant contributions to knowledge from reports and papers selected for review, this service is expected to save time for scientists and engineers searching the literature. (BPR abstract)
PB-177 838 HC$3.00 MF$0.65

REVIEW OF LITERATURE ON THE COACTION BETWEEN SOCIAL GROUPS AND PHYSICAL ENVIRONMENT,
Ohio State Univ. Research Foundation, Columbus.
For primary bibliographic entry see Field 5J.
PB-177 840 HC$3.00 MF$0.65

GLOSSARY OF TECHNICAL TERMINOLOGY (FRENCH, ARABIC, CHINESE) FOR USE WITH PLANT REQUIREMENT REPORT SERIES.
Educational Services, Washington, D. C.
For primary bibliographic entry see Field 13H.
PB-177 917 HC$3.00 MF$0.65

INDUSTRIAL TECHNICAL LIBRARIES OF PAPERBACK BOOKS: 'LITTLE LIBRARIES'. REVISION 4 CODE B-15.
Agency for International Development, Washington, D. C. Publications and Technical Services Branch.
Oct 62, 102p

Descriptors: (*Textbooks, Bibliographies), (*Libraries, Textbooks), Handbooks, Instruction manuals, Dictionaries, Costs, Indexes, Management engineering, Economics, Social communication, Industries, Public health, Agriculture, Social sciences, Chemistry, Physics, Mathematics, Geology, Minerals.
Identifiers: *Paperbook books.

The report lists collections of paperbook books selected as representative of U. S. technical literature in each of the sectors covered. The sectors covered are: Industrial organization and management; The United States business system; Public administration; Communications resources; Economics; Industrial technology; Public health and related topics; Agriculture; Physical sciences; The life sciences.
PB-178 061 HC$3.00 MF$0.65

SCIENCE INFORMATION SPECIALIST TRAINING PROGRAM.
George Washington Univ., Washington, D. C. Biological Sciences Communication Project.
For primary bibliographic entry see Field 5I.
PB-178 072 HC$3.00 MF$0.65

NATIONAL TRAFFIC SAFETY DATA CENTER PROJECT DEFINITION PHASE. VOLUME I,
EBS Management Consultants, Inc., Washington, D. C.
Jack Moshman, and Lester A. Barrer. Nov 67, 196p* EBSMC-45-0920-2-Vol-1
Contract FH-11-6521
See also Volume 2, PB-178 184.

Descriptors: (*Data processing systems, Traffic), (*Traffic, *Safety), Federal budgets, Technical information centers, Passenger vehicles, Motor vehicle accidents, Motor vehicle operators, Documentation, Roads.
Identifiers: National traffic safety data center project.

The final report of the project definition phase for a National Traffic Safety Data Cenrer (also known as the National Accident and Injury Investigation and Analysis Center) contains the budgetary requirements for the first ten (10) years of operation, the numbers and qualifications of required personnel, the necessary equipment and associated software, the operating methodologies, and a program of implementation. To determine the dimensions of these characteristics, an analysis of the sources and uses of appropriate information on drivers, vehicles, highways, and accidents was made. The user population, both immediate and potential, has been identified by type and number. The combination of users and uses resulted in estimates of file activity for the NTSDC. Recommendations concerning degrees of centralization and decentralization of the Center's activity are made. (Author)
PB-178 183 HC$3.00 MF$0.65

NATIONAL TRAFFIC SAFETY DATA CENTER PROJECT DEFINITION PHASE. VOLUME II,
EBS Management Consultants, Inc., Washington, D. C.
Jack Moshman, and Lester A. Barrer. Nov 67, 62p* EBSMC-45-0920-2-Vol-2
Contract FH-11-6521
See also Volume 1, PB-178 183.

Descriptors: (*Data processing systems, Traffic), (*Traffic, *Safety), Technical information centers, Documentation, Sources, Data, Management planning, Communication systems, Feasibility studies.
Identifiers: National traffic safety data center project.

Contents: Sources of information; Proposed organization and personnel for NTSDC; A brief description of the GSA advanced record system; Typical operating modes for the NTSDC communication system; Federal traffic data system feasibility study.
PB-178 184 HC$3.00 MF$0.65

EXPANDED STUDY OF DATA PROCESSING AND COMPRESSION TECHNIQUES,
Thomas Bede Foundation, Los Altos, Calif.
Brenda P. Bittner, I. Browning, and N. B. Winkless, III. Dec 67, 47p
Contract AT (29-1)-789

Descriptors: (*Information retrieval, *Data processing systems), Accuracy, Subject indexing, Reading machines, English language, Indexes, Syntax, Questionnaires, Computer programs.

For abstract, see NSA 22 10.
SC-CR-67-2864 HC$3.00 MF$0.65

5C. Economics

ESTIMATES OF AIRCRAFT CHARACTERISTICS WITH SOME IMPLICATIONS FOR COST ANALYSIS,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 1C.
AD-669 341 HC$3.00 MF$0.65

AN ECONOMETRIC MODEL OF UNITED STATES GOVERNMENT REVENUES AND EXPENDITURES,
George Washington Univ Washington D C Logistics Research Project
Dale M. Heien. 1 May 68, 189p Rept no. Serial T-206
Contract N00014-67-A-0214

Descriptors: (*Economics, Federal budgets), (*Budgets, Mathematical models), Money, Industrial production, Maintenance, Commerce, Government procurement, Industrial procurement, Costs, Medicine, Employment, Transportation, Numerical methods and procedures, Housing, Predictions, Theses.

This dissertation describes an econometric model of the U.S. economy with particular emphasis on the government sectors. Annual data covering the period 1947-65 were used to estimate the model. The model contains 167 estimated relations, many of which were tested for structural stability. The model begins with an aggregate consumption function based on the 'life-cycle' hypothesis. This relation determines the sum of personal consumption expenditures and total state and local purchases of goods and services. Two additional relations then determine personal consumption expenditures and total state and local purchases. The personal consumption sector is composed of 23 separate goods and services. Demand relations were estimated for each of these categories. These estimates comprise a complete set of demand relations. Demand for state and local goods and services are given in terms of prices and total state and local receipts. Supply relations for all goods and services, both public and private, are also estimated. The demand for plant and equipment investment is derived from the neoclassical theory of investment. The income sectors of the model provide the accounting structure for tax receipts and transfer payments, along with relations determining wages and salaries, interest, dividend, rental, and proprietary income.
AD-669 464 HC$3.00 MF$0.65

PRESHOT AND POSTSHOT SAFETY SURVEY OF OIL AND GAS FACILITIES BAXTERVILLE FIELD MISSISSIPPI,
Bureau of Mines Bartlesville Okla
For primary bibliographic entry see Field 18C.
AD-669 484 HC$3.00 MF$0.65

DETERMINATION OF WEIGHT, VOLUME AND COST FOR TANKERS AND DRY CARGO SHIPS,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 13J.
AD-669 568 HC$3.00 MF$0.65

THE ROLE OF GROWTH CENTERS IN REGIONAL ECONOMIC DEVELOPMENT.
Iowa State Univ. of Science and Technology, Ames. Dept. of Economics.
Sep 66, 137p*
Prepared in cooperation with Department of Commerce, Washington, D. C. Office of Regional Economic Development.

Descriptors: (*Economics, Growth), (*Urban planning, Economics), Organizations, Money, Law, Urban areas, Commerce, Wages.

Contents: Introduction; Economic development regions, The meaning of regional development, Growth centers, Growth center as policy instrument, The structure of the report, Summary and appraisal of research on growth center and related concepts in the United States; Urban growth and development, Product markets and commodity flows, Factor markets and resource transfers, Viable institutions and institution linkages, and Public programs and growth center development.
PB-177 542 HC$3.00 MF$0.65

A FEASIBILITY STUDY TO IDENTIFY THE UNDEREMPLOYED AND TO EXAMINE THE LABOR MARKET ATTACHMENT OF LABOR FORCE NONPARTICIPANTS IN A LOW-INCOME AREA,
Georgia Univ., Athens. Bureau of Business and Economic research
For primary bibliographic entry see Field 5I.
PB-177 559 HC$3.00 MF$0.65

AN INVESTIGATION OF THE UTILIZATION OF THE MANPOWER SKILLS OF THE 1964 GRADUATING CLASS OF GRAMBLING COLLEGE.
Grambling Coll., La.
For primary bibliographic entry see Field 5I.
PB-177 560 HC$3.00 MF$0.65

EMPLOYMENT PATTERN OF XAVIER UNIVERSITY GRADUATES OF 1964,
Xavier Univ., New Orleans, La. Placement Office.
For primary bibliographic entry see Field 5I.
PB-177 561 HC$3.00 MF$0.65

POVERTY AND HEALTH IN THE UNITED STATES. A BIBLIOGRAPHY WITH ABSTRACTS.
Medical and Health Research Association of New York City, N. Y.
For primary bibliographic entry see Field 5B.
PB-177 655 HC$3.00 MF$0.65

SELECTED ARCHEOLOGICAL AND HISTORICAL SITES IN WEST VIRGINIA.
Wheeling Coll., W. Va.
Aug 65, 258p

Preliminary plan for development. Prepared in cooperation with Area Redevelopment Administration, Washington, D. C.

Descriptors: (*Economics, West Virginia), Archaeology, Site selection, History, Recreation, Museums, Costs, Employment, Natural resources, Industries.
Identifiers: Area redevelopment, Tourist industry.

The objectives of this project were (a) To identify archeological-historical sites in selected areas of West Virginia, to determine their potentials for development as tourist and recreational attractions, and to select the most promising sites for further study. (b) To link these sites with other existing or planned projects for attracting tourists and other visitors to the State. (c) To recommend specific immediate actions needed to be taken by private, local and State groups to acquire, develop or restore, finance, promote, manage and otherwise program use of archeological-historical sites that have high tourist potential. (d) To prepare cost estimates. (e) To suggest layout and architectural treatment of installations. (f) To estimate time schedules for making sites operational. (g) To estimate income and employment impact of the proposed sites on the tourist-serving industries in the State for 2-, 5-, and 10-year periods. (Author)
PB-177 659 HC$3.00 MF$0.65

FEASIBILITY STUDY OF AN AIRPORT INDUSTRIAL PARK IN CAPE MAY COUNTY, NEW JERSEY.
Porter, Armstrong, Ripa and Associates, Newark, N. J.
Feb 68, 124p*
Contract 7-35142
Prepared in cooperation with Economic Development Administration, Washington, D. C. and Development Counsellors International, Ltd.

Descriptors: (*Economics, New Jersey), (*Industries, Site selection), Airports, Feasibility studies, Growth, Employment, Population, Manufacturing methods, Water, Money, Terrain, Roads, Urban areas, Transportation, Sanitary engineering, Water supplies, Railroads, Costs.
Identifiers: Area planning and development.

Cape May County faces an economic problem which is not uncommon in many areas that depend almost exclusively on a short tourism season for their livelihood. In the County's case, an almost total dependence of a 10 week summer tourism season has resulted in chronic unemployment rates which, on an annual basis, average out to 2-1/2 times the national average. As a result, the median family income in the County is 40% lower than the New Jersey average, reflecting the extremely high unemployment rate during the winter months. Fortunately, the County's leadership, represented by the Board of Chosen Freeholders, decided to make an attempt to correct this situation by determining whether the economic base could be broadened by attracting industry that would employ people on a year-round basis. The result of this progressive stance in this action study which was developed and prepared as a technical assistance project under the auspices of the Economic Development Administration. (Author)
PB-177 696 HC$3.00 MF$0.65

A STUDY TO DEVELOP AN ACTION PLAN FOR THE ECONOMIC AND INDUSTRIAL DEVELOPMENT OF RHODE ISLAND.
Marcom, Inc., New York.
For primary bibliographic entry see Field 5A.
PB-177 761 HC$3.00 MF$0.65

A SURVEY OF THE MARKET FOR U. S. PRINTING MACHINERY IN JAPAN 1967,
Marplan Japan.
R. W. Austin. 12 Sep 67, 59p
Prepared in cooperation with Business and Defense Services Administration, Washington, D. C.

Descriptors: (*Commerce, Japan), (*Printing, *Machines), Analysis, Distribution, Densitometers, Electronic equipment, Photographic recording systems, Machines, Automation, Chemicals, Economics.
Identifiers: Market survey, Graphic arts.

The primary purpose of this survey is to provide up-to-date information about the potential for the importation and sale of U.S. graphic arts and printing equipment in Japan.
PB-177 843 HC$3.00 MF$0.65

REPORT ON GAS-CUTTING AND WELDING EQUIPMENT.
Adams-Boston Co. Ltd., Tokyo (Japan).
For primary bibliographic entry see Field 13H.
PB-177 845 HC$3.00 MF$0.65

BRAZIL'S INDUSTRIAL AND SCIENTIFIC INSTRUMENTATION (PRODUCTION - IMPORTS - CONSUMPTION AND PROSPECTS) MARKET POTENTIAL FOR U. S. PRODUCTS.
Pesquisas Economicas Banas, Sao Paulo (Brazil).
Nov 67, 66p*
Prepared in cooperation with Business and Defense Services Administration, Washington, D. C.

Descriptors: (*Commerce, *Brazil), Instrumentation, Industrial equipment, Scientific research, Electronic equipment, Test equipment, Checkout equipment, Medical equipment, Computers, Costs, Consumption, Distribution (Economics), United States.
Identifiers: Market surveys, Imports, Exports.

This study covers the imports, exports, local promotion and consumption of industrial and scientific instrumentation in Brazil. It shows, within the limitations of the collected data, projected demand for those specific commodities that are not produced in Brazil, or whose Brazilian production is inadequate to meet demand. It reports on general market conditions as well as on any factors that might determine a growth in Brazilian production and or imports, including those of a financial or fiscal nature, or that are the result of the country's overall economic policy or of special programs.
PB-177 846 HC$3.00 MF$0.65

THE IMPACT OF DEFENSE CONTRACT TERMINATION ON THE LABOR FORCE,
Arizona Univ., Tucson.
Trevor Bain. Jun 67, 159p*
Grant DL-91-03-66-39

Descriptors: (*Contracts, *Employment), (*Labor, Contracts), Federal budgets, Department of Defense, Economics, Manpower, Wages, Industries.
Identifiers: *Defense contracts.

Tucson had a strong growing economy prior to the layoff. The inability of Hughes workers to find new permanent employment in a short time was due to the lack of comparable job opportunities. There were not enough vacancies at similar skill levels to absorb even small numbers. The company and its labor force were in an extremely sensitive position in the community since their pay scale and employee benefits were better than those offered by other employers. The workers were reluctant to accept lower-paying positions, and potential employers felt that the ex-Hughes workers would return to their former job if recalled. Labor market conditions were aggravated by the presence of a large number of unemployed workers who had been laid-off after construction of the Titan missile sites. The termination of the two large defense contracts within a year resulted in a multiplier effect on home and business construction as well as the service sector. Prospective employers limited expansion and new hires. The Hughes work force and the community were unprepared for the layoff and its consequences. All groups anticipated that the government would intervene and maintain employment. the community appeared unable and unwilling to engage in self-help activities. Many of the discharged desired to remain in Tucson or felt tied to the community for health reasons. The company and the employment service were hampered in their job placement activities by insufficient lead-time. Lack of comparability in job titles between Hughes and prospective employers hindered the use of formal labor market placement services. (Author)
PB-177 873 HC$3.00 MF$0.65

TANGANYIKA INDUSTRIAL DEVELOPMENT: A PRELIMINARY STUDY OF BASES FOR THE EXPANSION OF INDUSTRIAL PROCESSING ACTIVITIES.
Little (Arthur D.), Inc., Cambridge, Mass.
Dec 61, 206p ADL-C-63989

Descriptors: (*Industries, *Tanganyika), Industrial production, Economics, Analysis, Wages, Limestone, Organizations, Commerce, Labor, Chemicals, Textiles, Fibers, Buildings, Fruits, Vegetables.

The survey was made at the request, and under the general policy guidance, of the Ministry of Commerce and Industry of the Government of Tanganyika. Under the general terms of the assignment, as specified by the Ministry of Commerce and Industry and ICA, the ADL survey team had two major objectives: (1) to review the general bases for, and range of, industrial processing opportunities in Tanganyika and to make preliminary feasibility studies of selected opportunities; and (2) to recommend the type, activities, and staffing of an organization to achieve effective development of the country's industrial potential. During the slightly more than four man-months the survey team spent in Tanganyika, it enjoyed complete freedom in choosing the lines of its inquiries and was given the fullest cooperation by personnel of the Ministry of Commerce and Industry. The personnel in other ministries of the Tanganyika Government were also most cooperative in providing production and trade statistics and projections. In meetings with the Prime Minister and the heads of various government agencies, we explored government policies and objectives regarding industrial processing. We also made numerous contacts with participants in the present business activities of the country. (Author)
PB-177 911 HC$3.00 MF$0.65

DEVELOPMENT PLAN, VANCE COUNTY, N. C.
North Carolina State Dept. of Conservation and Development. Div. of Community Planning.
For primary bibliographic entry see Field 13B.
PB-178 003 HC$3.00 MF$0.65

AIR/INDUSTRIAL PARK MERCER COUNTY AIRPORT WEST VIRGINIA FEASIBILITY STUDY AND ADDITIONAL STUDIES FOR AN INDUSTRIAL PARK SITE MERCER COUNTY.
Airways Engineering Corp., Washington, D. C.
Nov 67, 146p
Prepared in cooperation with Economic Development Administration, Washington, D. C.

Descriptors: (*Industries, Site selection), Economics, Natural resources, Coal, Manpower studies, Feasibility studies, Costs, Maps, Linear systems, West Virginia.

This study evaluates local raw material resources, power and fuel, supplies, markets, and market obstacles, labor, transportation, climate, water supply and local governmental policies.
PB-178 010 HC$3.00 MF$0.65

EXTENDING EMPLOYMENT IN THE PEACH INDUSTRY THROUGH BETTER MARKETING AND MORE PROCESSING.
Final rept.,
Georgia Experiment Station, Experiment.
E. K. Heaton, T. S. Boggess, Jr., K. C. Li, and J. G. Woodroof. Feb 68, 93p
Contract C-23-66

Descriptors: (*Fruits, Industries), (*Employment, Industries), Processing, Labor, Food, Distribution, Frozen foods, Dehydration, Refrigeration systems, Canning, Standards, Containers, Quality control, Georgia.

This project follows a previous study of the Georgia peach industry in which emphasis was placed n the development of new peach products. The five products studied were: (a) puree-type peach base for drinks and ice cream, (b) refrigerated fresh peach slices, (c) clear peach concentrate, (d) improved canned Georgia peaches, and (e) pasteurzed partially dehydrated peaches. (Author)
PB-178 026 HC$3.00 MF$0.65

POPULATION AND ECONOMIC BASE STUDY FLORENCE, SOUTH CAROLINA.
Florence, S. C.
For primary bibliographic entry see Field 13B.
PB-178 027 HC$3.00 MF$0.65

FEASIBILITY STUDY OF DEVELOPMENT OPPORTUNITIES JOSEPHINE COUNTY, OREGON.
Smith (Larry) and Co., Inc., San Francisco, Calif.
Mar 68, 147p
Contract C-344-66

Descriptors: (*Rural areas, Economics), Feasibility studies, Advanced planning, Industries, Agriculture, Recreation, Site selection, Population, Sociology, Statistical analysis, Oregon.
Identifiers: Josephine County (Oregon), Tourism, Senior citizens.

This report has been prepared for the Economic Development Administration to evaluate and analyze the potential industrial and resort-recreational development opportunities which exist in Josephine County, Oregon, at the present time and in future years to 1985. This study has been undertaken as a first step in determining the potential development opportunities for properties of this type in order to provide consistency between development planning and the anticipated market forces in this part of Southern Oregon in future years, and can be expected to form one of the bases for final development and financial planning.
PB-178 032 HC$3.00 MF$0.65

REGIONAL ECONOMIC DEVELOPMENT IN THE UNITED STATES. PART I.
Economic Development Administration, Washington, D. C.
Oct 67, 134p*
See also Part 2, PB-178 170, and Appendices, PB-78 171.

Descriptors: (*Economics, United States), Growth, Employment, Money, Wages, Manpower, Law, Population, Rural areas, History, Reports, Operation, Urban areas, Management planning, Distribution, Symposia, Research program administration.

The report, Regional Economic Development in the United States, has been prepared to explain regional economic development problems and policies in the United States to the delegates of Working Party No. 6 of the Industry Committee of OECD. In order to provide a frame of reference from which regional development problems in the United States can be viewed, we have included in Chapter 2 an historic overview of the United States economy. The peculiar constraints that the highly decentralized and independent Federal System impose on regional development in the United States is the subject of Chapter 3. In Chapter 4 we have included several papers on regional planning and development policies written by outstanding authorities in the field in order to provide a frame of reference encompassing both the private and the public viewpoint. (Author)
PB-178 169 HC$3.00 MF$0.65

REGIONAL ECONOMIC DEVELOPMENT IN THE UNITED STATES, PART 2.
Ecomomic Development Administration, Washington, D. C.
Oct 67, 157p*
See also Appendices, PB-178 171 and part 1 PB-78 169.

Descriptors: (*Economics, United States), Statistical data, Employment, Wages, Budgets, Urban planning, Growth, Training, Education, Analysis, Law, Population, Geography.
Identifiers: Economic Development Administration.

The report, consisting of 3 parts, has been prepared to explain the regional economic development problems and policies in the United States. Part 2, here, consists of Chapters 5 through 8. Chapter 5 is concerned with a discussion of the legislation establishing the Economic Development Administration and its program. Chapter 6 presents a discussion of EDA's program in operation. Chapter 7 presents case histories of four economic development regions which have been established. The final chapter of the report discusses the role of urbanization in the economic development process.
PB-178 170 HC$3.00 MF$0.65

ALTERNATIVE BUDGETING PROCEDURES FOR COMMUNITY ACTION PROGRAMS.
Technical rept.,
Baxter, McDonald and Co., Berkeley, Calif.
Alfred W. Baxter. Jul 66, 49p* TR-1
Contract OEO-1206

Descriptors: (*Sociometrics, Budgets), Federal budgets, Distribution, Decision making, Mathematical models, California, Management engineering, Optimization, Costs, Cost effectiveness.
Identifiers: Communite action programs, Anti poverty program.

This document is the first in a series of three technical reports: it summarizes the work accomplished during the first third of the contract period. Several alternative budgeting techniques are described for consideration by the Western Regional Director. Some of the materials in this report have also been presented informally to a conference of OEO regional directors. This report also reflects conclusions from a series of staff level conferences in the Western Regional Offices and meetings with staff members of Community Action Agencies in the Western Region. (Author)
PB-178 172 HC$3.00 MF$0.65

BUDGETING AND MANAGING COMMUNITY ACTION PROGRAMS.
Technical rept.,
Baxter, McDonald and Co., Berkeley, Calif.
Alfred W. Baxter. Feb 67, 34p* TR-2
Contract OEO-1206

Descriptors: (*Sociometrics, Budgets), Federal budgets, Manpower studies, Cost effectiveness, Public opinion, Records, Training, Population, Management engineering, Costs, Classification, Decision making, California.
Identifiers: Community action programs, Anti poverty program.

This report, based in large part upon the findings of the field visits, contains three principal recommendations. As these recommendations relate respectively to cadre development, explicit statement of program purpose, and to a new budgeting technique, they are summarized and discussed.
PB-178 173 HC$3.00 MF$0.65

BUDGETING AND EVALUATING COMMUNITY ACTION PROGRAMS.
Technical rept.,
Baxter, McDonald and Co., Berkeley, Calif.
Alfred W. Baxter. Feb 68, 60p* TR-3
Contract OEO-1206

Descriptors: (*Sociometrics, Budgets), Costs, Population, Distribution, Statistical processes, Correlation techniques, Management engineering, Cost effectiveness, California, Manpower, Education, Housing, Public health, Food, Law, Money, Organizations.
Identifiers: Community action programs, Antipoverty program.

This report recommends specific methods for quantifying those elements in OEO grant applications which can be related explicitly to achievement of War on Poverty objectives and recommends a specific approach to inter-program benefit/cost budgeting which can be used by CAAs as a help in program design and in their determinations of what programs to fund. The report also presents the results of the Contractors' field testing of these methods. (Author)
PB-178 174 HC$3.00 MF$0.65

5D. History, Law, and Political Science

A SURVEY OF ELITE STUDIES.
Research memo.,
American Univ., Washington, D. C. Special Operations Research Office.
Carl Beck, James M. Malloy, William R. Campbell, and Jerry L. Weaver. Mar 65, 65p RM-65-3
Contract DA-49-092-ARO-7

Descriptors: (*Government (Foreign), Leadership), (*Political science, Leadership), Counterinsurgency, MILITARY GOVERNMENT, Bibliographies, Classification, Analysis, United States, Canada, Western Europe, USSR, Middle East, South Asia, Southeast Asia, Far East, Supervision, Decision making, Social psychology, Group dynamics, Motivation, Attitudes.
Identifiers: Political Elite.

In this essay some factors are suggested that seem relevant to the study of political elites. It would be premature to title this section a research scheme, but it is the foundation upon which such a scheme could be developed. The assumption underlying the following presentation is: for many reasons, particularly because of the complexity of social organization, some individuals and groups are more influential in political decision making than others. These individuals and groups make up the political elite. The relationship of individuals and groups within the elite, as well as the relationship of the elite to the nonelite, vary from state to state and from situation to situation. Since the elite shapes the structure and decisions of a state or polity, an understanding of the structure and behavior of the elite is crucial to an understanding of the polity. (Author)
AD-464 906 HC$3.00

REVIEW OF PARTY BUILDING IN A NEW NATION: THE INDIAN NATIONAL CONGRESS,
Rand Corp Santa Monica Calif
Wayne Wilcox. Apr 68, 4p Rept no. P-3833
Availability: To be published in Political Science Quarterly, New York.

Descriptors: (*Political science, *India), Leadership, Organizations, Social sciences, Anthropology, Reviews.

Myron Weiner's third and most detailed study of political participation in Indian democracy is as crowded with facts and teeming with ideas as the reality it seeks to describe. The method of the book is to enrich political development concepts with anthropological data, and to base conclusions on the twin supports of development theory and five depth case studies. (Author)
AD-669 203 Not available from CFSTI.

TELEVISED OMBUDSMAN,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 17B.
AD-669 319 HC$3.00 MF$0.65

AREA HANDBOOK FOR COMMUNIST CHINA,
American Univ Washington D C Foreign Area Studies Div
For primary bibliographic entry see Field 8F.
AD-669 528 MF$0.65

ASIAN FUTURES,
Rand Corp Santa Monica Calif
Charles Wolf, Jr. May 68, 15p Rept no. P-3852

Descriptors: (*Political science, *Southeast Asia), Vietnam, Predictions, Probability, Bombing, Government (Foreign), Foreign policy, Foreign aid.

Consideration is given to the effects of recent American political events on the situation in Southeast Asia; with particular attention focused on the restricted bombing policy announced in early 1968.
AD-669 558 HC$3.00 MF$0.65

THEORETICAL PROBLEMS OF GUIDING THE SOCIETY,
Joint Publications Research Service, Washington, D. C.
E. M. Korzheva, I. I. Malkhin, and Yu. M. Smolentsev. 8 Feb 68, 10p
Trans. of Voprosy Filosofii (USSR) n11 p136-40 1967.

Descriptors: (*Communism, Symposia), Organizations, Communists, Sociology, History, Personnel, Philosophy, Leadership, Economics, USSR.
JPRS-44291 HC$3.00 MF$0.65

5E. Human Factors Engineering

COMPARATIVE STUDY OF BODY DISPLACEMENTS IN BOTH HUMANS AND ANTHROPOMORPHIC DUMMIES WHEN SIMULTANEOUSLY SUBJECTED TO CONTROLLED VERTICAL IMPACT TYPE DECELERATIONS.
Phase rept.,
Naval Air Development Center Johnsville Pa Aerospace Crew Equipment Dept
Marcus Schwartz. 8 Apr 68, 185p Rept no. NADC-AC-6808

Descriptors: (*Ejection seats, Design), (*Anatomical models, Crash injuries), Experimental design, Anthropometry, Humans, Correlation techniques, Aviation accidents, Human engineering, Deceleration, Body, Impact tests, Dynamics.

The report concerns Phase I of a research program to determine if a correlation in displacements exists between humans and anthropomorphic dummies of like proportions when subjected to vertical crash type forces for extrapolation into the high impact region where only dummies can be utilized. Although similarities were found when comparing the displacements in the leg area, the upper torso could not be correlated in any but a highly complex way. Although direct correlation is not practical, much useful information has been gained. The dynamics of the human body as it affects the performance of pilot ejection systems is considered to be very significant, and as yet undetermined. (Author)
AD-669 466 HC$3.00 MF$0.65

APOLLO APPLICATIONS PROGRAM CREW MOTION EXPERIMENT PROGRAM DEFINITION AND DESIGN DEVELOPMENT.
Martin Co., Denver, Colo.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 06 12.
N68-22151 HC$3.00

INFORMATION PROCESSING IN THE FUNCTIONAL VISUAL FIELD.
Informatieverworking in Het Funktioneel Gezichtsveld
National Aeronautics and Space Administration, Washington, D. C.
A. F. Sanders. Dec 67, 13p NASA-TT-F-11408 Tran- Transl. Into English From Dutch, Rept. No. Izf 1967-6

Descriptors: *Information theory, *Visual fields, Feedback, Human performance, Theorem proving, Visual tasks.

For abstract, see STAR 06 12.
N68-22815 HC$3.00 MF$0.65

SURVEY OF THE GERMAN MARKET FOR AMERICAN FLUID POWER EQUIPMENT,
Cohrssen (Hans) (Germany).
Hans Cohrssen. Jan 68, 72p*
Prepared in cooperation with Business and Defense Services Administration, Washington, D.C.

Descriptors: (*Economics, West Germany), (*Fluidics, *Commerce), Growth, Statistical analysis, Patents, Production, Standards, Hydraulic actuators, Hydraulic servomechanisms, Pneumatic devices, Variable speed drives, Hydraulic systems, Periodicals, Predictions.
Identifiers: Market surveys.

Contents: Summary and conclusions; The German market; Future market prospects; and Promoting US exports.
PB-177 847 HC$3.00 MF$0.65

5G. Linguistics

ABOUT THE 'HISTORICAL' AND THE 'LOCAL' LEGEND AND THEIR RELATIVES,
Rand Corp Santa Monica Calif
Heda Jason. May 68, 30p Rept no. P-3839

Descriptors: (*Language, Culture), (*Culture, *Anthropology), Analysis, Social communication, Linguistics.
Identifiers: Folktales.

The most well known definition of the legend, and the fundamental one to all other definitions, is the one of the Brothers Grimm: a legend is a story which is believed; it is told about a definite (real or fabulous) person, event or place. Four factors are included in this definition: (1) the legend fits somewhere in the dimension of the historical time of the narrator: (a) the legend is connected with a definite historical (real or fabulous) event; (b) the legend is connected with a definite person, i.e., a named historical (real or fabulous) figure; (2) the legend fits somewhere in the dimension of the geographical space of the narrator: it is connected with a definite place; (3) the legend is a true story: i.e., although it deals with supernatural events, it is 'believed' by its bearers, it is regarded as being placed in the real world of the narrator and of his audience (contrary to this the fairy-tale, also dealing with supernatural events, is not 'believed' by the same narrating community). The Grimms' propositions are examined on a corpus of Jewish-Near Eastern legendary material. (Author)
AD-669 338 HC$3.00 MF$0.65

A PHONOLOGICAL RULE TESTER,
Bolt Beranek and Newman Inc Cambridge Mass
Daniel G. Bobrow, and J. Bruce Fraser. 31 Jan 68, 37p* Rept nos. Scientific-5, BBN-1589
AFCRL-68-0085
Contract F19628-68-C-0125, ARPA Order-627

Descriptors: (*Phonetics, Analysis), Linguistics, Theory, English language, Programming languages, Transformational grammars.
Identifiers: Phonology, List processing, On-line systems.

The paper reports on the design and implementation of a system to alleviate the problem of rule evaluation for the linguist in the area of phonology. The system permits the user to define, on-line, sets of rules statable within the framework presented in 'The Sound Patterns of English' (N. Chomsky and M. Halle, 1968), to define phonemes as bundles of specified distinctive features, to define data as strings of phonemes with associated grammatical structure, to test the effect of applying rules to the data, and to store both the definitions and results. The system was written in BBN LISP (Bobrow et al. 1967) on the Scientific Data System 940 computer. The rule application facility described in detail later was implemented by translating the linguistic rules to rules in FLIP (Teitelman, 1967), a format directed list processor embedded in LISP. This made the system construction easy while providing very sophisticated capabilities for the linguist. The system is designed to be used on-line in interactive fashion, with control returned to the user after each command is executed. (Author)
AD-669 348 HC$3.00 MF$0.65

THE DEVELOPMENT OF PSYCHOLOGICAL MODELS FOR SPEECH RECOGNITION.
Rept. for 1 Sep 65-31 Aug 67,
Massachusetts Inst of Tech Cambridge Dept of Psychology
J. A. Fodor, T. G. Bever, and M. Garrett. Jan 68, 92p
ESD-TR-67-633
Contract AF 19 (628)-5705

Descriptors: (*Speech recognition, *Transformational grammars), Perception (Psychology), Syntax, Performance (Human), Psychoacoustics, Artificial intelligence.
Identifiers: *Psycholinguistics, Information processing (Psychology).

The report has two principal sections. In Section I the theoretical issues relating to the development of syntax recognition routines based on psychological models of human speech recognition are discussed and the relevant psychological literature reviewed. The research reported in this section deals with attempts to relate various syntactic variables to measures of the perceptual complexity of sentences. The results of the research indicate that (1) analysis by synthesis routines are probably not appropriate as models of the system employed by human speakers for speech recognition, (2) the complexity of sentences is not related in any direct way to the number of operations required by a grammar to produce them, and (3) both the lexical structure of verbs and the relation of certain other lexical formatives to transformational operations of the grammar are significantly related to the ease of understanding sentences. Section II of the report deals with research concerning the perceptual segmentation strategies employed by speakers in their analysis of continuous speech. The report details the development of a particular investigative technique and its application to the determination of segmentation strategies. The research reported indicates that speech signals are initially analyzed into segments that approximate the clause. The experiments reviewed explore the relationship between the constituent structure of sentences and this clause-like segmentation. (Author)
AD-669 360 HC$3.00 MF$0.65

RESEARCH POSSIBILITIES IN PHONETICS,
California Univ Los Angeles
Peter Ladefoged. 1968, 5p
Availability: Published in Annual Bulletin Res. Inst. Logopedics and Phoniatrics n1 p31-4 15 Apr 1967.

Descriptors: (*Phonetics, Scientific research), Speech, Synthesis, Laboratories, Linguistics, Electromyography, Computers, Simulation.
Identifiers: Psycholinguistics, Information processing (Psychology).

Some of the general questions underlying the current research include the following: (1) What kinds of information are conveyed by speech; (2) What

are the physiological and acoustic correlates of the various information bearing aspects of speech; (3) How is the information conveyed by speech represented within the brain; (4) How is this stored information encoded so that speech may be produced; and (5) How are speech sounds interpreted by a listener as representations of the information encoded by the speaker.
AD-669 543 Not available from CFSTI.

CONSTRUCTION OF SEMANTIC TREES FOR TERM DEFINITIONS,
Joint Publications Research Service, Washington, D. C.
L. E. Pshenichnaya. 21 Mar 68, 10p
Trans. of Nauchno-Tekhnicheskaya Informatsiya. Seriya 2, Informatsionnye Protsessy i Sistemy (USSR) n6 p12-6 1967.

Descriptors: (*Semantics, *Information retrieval), Vocabulary, Russian language, Word association, Dictionaries, USSR.

The problem of comparing the meaning of terms plays a large part in solving problems of information search (establishing a criterion os semantic correspondence). The meaning of a term may be represented through the system of its associations with other terms and words of the language on the text and vocabulary levels. In this paper, the meaning of a word is considered on the vocabulary level. It is assumed that the system of immanent (constant) associations of the term with other terms and words of the language is fixed in the dictionary definition of the term. Hence the definition of the term is an object of comparison. The operation of comparison necessarily presupposes division of the objects to be compared (with the exception of complete coincidence of objects). Thus the definition becomes an object of division. A formal procedure is examined for division of the definition and construction of a semantic tree for the meaning of a term. The semantic association between terms is found by comparing the meanings of the terms. The depth of the semantic association is limited by the system of elementary initial units. Elementary semantic units are not distinguished in general, but only for a specifically selected system of semantic units (in our case, the elements of a specialized glossary). Obviously comparison of the meanings of terms presupposes reduction of the meaning of a term to a system of elementary semantic units. (Author)
JPRS-44774 HC$3.00 MF$0.65

5I. Personnel Selection, Training, and Evaluation

A MODEL FOR AUTOMATION OF PERSONNEL ASSIGNMENT.
Master's thesis,
Naval Postgraduate School, Monterey, Calif.
Russel Neal Blatt, and Dudley E. Cass. Oct 66, 113p

Descriptors: (*Naval personnel, Personnel management), (*Personnel management, *Data processing systems), Job analysis, Automation, Shipborne, Programming (Computers), Programming languages, Mathematical models, Subroutines, Naval training, Theses.
Identifiers: FORTRAN, AUTAM.

This thesis demonstrates the feasibility of computerized assignment of Naval enlisted personnel to fleet units. A model is constructed for determining the utility of each man for each possible ship assignment. Then various methods of assignment are investigated to find one which maximizes the summed utilities of assignment. To illustrate its capabilities, the model is then applied to several sample sets of men and ships. A model of this type should be implemented in the Navy's personnel distribution.
AD-489 885 HC$3.00 MF$0.65

PSYCHOPHYSIOLOGICAL FEATURES OF FLIGHT OVER WATER (PSIKHOFIZIOLOGICHESKIE OSOBENNOSTI POLETA NAD MOREM),
Foreign Technology Div Wright-Patterson AFB Ohio
I. D. Dolinskii. 22 Sep 67, 13p Rept no. FTD-MT-24-124-67
Edited machine trans. of Morskoi Sbornik (USSR), n8 p44-50 1965.

Descriptors: (*Flight crews, Training), (*Instrument flight, *Stress (Psychology)), Seas, Reaction (Psychology), Responses, Attention, Stability, Psychophysiology, Vision, Physical fitness, Recreation, Sea rescues, Aircraft landings.
Identifiers: Over ocean flight.

The difficulties associated with long flights over the sea stem from the lack of visual orientation and from the extreme meteorological conditions encountered. Since the interaction of physiological and psychological factors, not yet fully understood, may result in illusions, flight must be conducted by instruments. Instrument flying requires experience before pilots gain confidence in the instrument indications and accept them in lieu of erroneous sensations. Trained pilots can scan the instruments, correlate the readings to detect malfunctions, and analyze data. Standardization of the instrument panel facilitates training, and automation of the instrumentation simplifies the technique. In one automation system the images of the instruments are projected on the front cabin window, enabling the pilot to maintain visual contact with his environment while surveying the instruments. It has been noted that certain physical activities during flight reduce the illusion effect and that physically fit crews are less susceptible to illusions. For this reason a well planned and executed program of athletics and sports would be instituted for all air crews. The added danger of flying over water gives rise to fears which can aggravate the illusion effect. This fear can best be overcome by intensive rescue training, which gives the crews confidence in their own survival ability, in the rescue equipment, and in the search and rescue procedure. Since crews are scattered over wide areas when bailing out of fast, high flying planes, the rescue training must emphasize the individual's battle with the elements. (Author)
AD-669 269 HC$3.00 MF$0.65

THE APPLICATION OF THEORETICAL FACTORS IN TEACHING PROBLEM SOLVING BY PROGRAMED INSTRUCTION.
Technical rept.,
George Washington Univ Alexandria Va Human Resources Research Office
Robert J. Seidel, and Harold G. Hunter. Apr 68, 74p Rept no. TR-68-4
Contract DA-44-188-ARO-2

Descriptors: (*Problem solving, *Programmed instruction), Teaching methods, Learning, Motivation, Training, Programmers, Programming (Computers), Retention, Training devices.

In continuing research into the technology of training, a study was undertaken to devise guidelines for applying programed instruction to training courses that involve the learning of principles and rules for use in problem solving. As the research vehicle, a portion of the material in the Army's ADPS Programing Specialist Course was programed to explore several different factors in using automated instruction to teach computer programming. Experimental versions of the course were administered to over 900 subjects in various experimental groupings. Criterion and retention tests based on actual job problems were used to measure subjects' performance, along with in-training measures. Results in a series of prompting/confirmation variations indicated that giving subjects extensive stimulus support during training helps motivate them and improves scores during training, but hampers them in using what they have learned. Requiring subjects to fully write out rules during training hindered them in developing problem-solving skills applying these rules; however, using mneomonics (writing only the names of rules) during training aided subjects in retaining what they had learned, particularly for more complex material. Working with a variety of practice problems facilitated the learning of problem-solving skills. (Author)
AD-669 281 HC$3.00 MF$0.65

COMPUTER-BASED INSTRUCTION: PSYCHOLOGICAL ASPECTS AND SYSTEMS CONCEPTION OF INSTRUCTION.
Technical rept.,
Harvard Computing Center Cambridge Mass
Lawrence M. Stolurow. Dec 67, 26p Rept no. TR-4
Contract N00014-67-A-0298
Availability: Published in unidentified journal, p193-215.

Descriptors: (*Teaching methods, Computer programs), Learning, Decision making, Programming (Computers), Programmed instruction, Teaching machines, Cybernetics, Real time, Flow charting.
Identifiers: *Computer aided instruction, SOCRATES.

The report presents a conceptualization of the teaching-learning process in a way that permits the development of a computer-based instructional system. In the work described, the CBI system functioned as an aid in the development of real-time models in the form of computer-programs that teach. Using these programs, research can be conducted relating to the decision processes necessary for teaching. The particular system, SOCRATES, has been used to: (1) conduct research relating to an idiographic model of tutorial instruction; (2) study basic variables relating to learning and transfer; and (3) to develop the technology of using a CBI system to generate learning materials. Results from several studies are given. Some questions of programming strategies were examined with science materials; others using logic; others with culture assimilators; and still others using SOCRATES as an author. These studies show how CBI systems may be used in research and how varied are the content areas to which CBI systems are applicable. They also present one view of some of the principles that should be considered in the development of such systems. (Author)
AD-669 287 Not available from CFSTI.

FOR SCIENCE THERE ARE NO BOUNDS (DYLA NAUKI NET PERIFERII),
Foreign Technology Div Wright-Patterson AFB Ohio
A. Vorobev. 18 Aug 67, 8p Rept no. FTD-HT-23-838-67
Edited trans. from Izvestiya (USSR) p2 19 Mar 1967, by E. Harter.

Descriptors: (*Scientific research, USSR), Anomalies, Management planning, Money, Students, Research program administration, Supports, Scientific personnel, Universities.
Identifiers: Translations.

The document presents a newspaper article criticizing government agencies for failure to utilize the scientific potential and facilities of institutes of higher learning. Tomsk Polytechnical Institute is 70 years old and has 17 thousand students. It has developed many techniques for industry, yet gets no share in the profits. There should be a plan for reimbursing colleges in proportion to the value of their aid to industry. This institute, for example, is engaged in radiation technology, and has already contributed greatly to the technique of cutting frozen ground, and has developed the hydrochemical method of mineral exploration. Industry is often unaware of such research sources. (Author)
AD-669 297 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. I. SUMMARY OF THE STUDY.

Technical memo.,
American Institutes for Research Pittsburgh Pa
John D. Folley, Jr., Robert B. Miller, and William E. Feroglia. Jun 56, 17p
ML-LOWRY-TM-56-1
Contract AF 18 (600)-1351
See also ML-LOWRY-TM-56-2, AD-669 398.

Descriptors: (*Jet fighters, Maintenance), (*Electronic technicians, *Military training), Management planning, Job analysis, Fuel systems, Selection, Education, Test facilities, Test equipment (Electronics), Electrical equipment, Electronic equipment, Aircraft fire control systems, Communication systems, Navigation, Automatic pilots, Logistics.
Identifiers: F-86 aircraft, F-86D aircraft, *Core training, Avionics, Trouble shooting, On-the-job training.

The report should be of interest to agencies concerned with planning, developing, and conducting training for electronic maintenance personnel. It summarizes a study directed toward development of a training course whose content is generalizable among a group of maintenance positions - specifically, the family of positions used within Air Defense Command Squadrons in maintaining the electronic systems in the F-86D aircraft. The course is designed to precede formal and on-the-job training for a specific maintenance position. However, in contrast to the usual 'fundamentals of electronics' course, it places more emphasis on the performance of specific maintenance activities. The course is aimed at increasing personnel flexibility. For present purposes, this course will be referred to as core training. The present report is the first of a series of four reports which describe the development of core training. Other reports present: (a) a compilation of the skills and knowledges identified as common among the positions; (b) a detailed description of the course developed for training these skills and knowledges; and, (c) a discussion of the general principles and techniques for deriving courses of this type. (Author)
AD-669 397 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. II. IDENTIFICATION OF TRAINING CONTENT.
Technical memo.,
American Institutes for Research Pittsburgh Pa
William E. Feroglia, Edward L. Holshouser, and John D. Folley, Jr. Jun 56, 79p
ML-LOWRY-TM-56-2
Contract AF 18 (600)-1351
See also ML-LOWRY-TM-56-3, AD-669 399.

Descriptors: (*Electronic technicians, Training), (*Jet fighters, Maintenance), (*Electronic technicians, *Military training), Air Force personnel, Air Defense Command, Maintenance personnel, Teaching methods, Job analysis, Aptitude tests, Selection, Aircraft engines, Fuel systems, Communication systems, Navigation, Aircraft fire control systems, Automatic pilots, Pattern recognition, Test facilities, Logistics.
Identifiers: F-86 aircraft, F-86D aircraft, Avionics, Trouble shooting, On-the-job training, *Core training.

The present report summarizes the procedures used in compiling skills and knowledges identified as common among the F-86D maintenance positions, and the appendices to this report present the detailed descriptions of activities, skills, and knowledges associated with specific job objects and with specific steps in the work cycle. Other reports in the series introduce and summarize the study, present a detailed description of the core training course developed for training these skills and knowledges, and discuss the general principles and techniques for deriving courses of this type. The narrative body of this report presents a description of maintenance practices within Air Defense Command squadrons, a description of F-86D electronic maintenance positions, a summary of the procedures used in identifying generalizable skills and knowledges, and a summary of these skills and knowledges. The appendices to the report describe the activities connected with the work cycle steps and with specific job objects. (Author)
AD-669 398 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. III. DERIVATION OF TRAINING CHARACTERISTICS,
American Institutes for Research Pittsburgh Pa
John D. Folley, Jr., and Robert B. Miller. Jun 56, 51p
ML-LOWRY-TM-56-3
Contract AF 18 (600)-1351
See also ML-LOWRY-TM-56-4, AD-669 400.

Descriptors: (*Jet fighters, Maintenance), (*Electronic technicians, *Military training), Fuel systems, Communication systems, Maintenance personnel, Selection, Navigation, Test equipment (Electronics), Test facilities, Test methods, Logistics, Research program administration, Job analysis, Aircraft fire control systems, Automatic pilots, Circuits, Aptitude tests, Pattern recognition.
Identifiers: F-86 aircraft, F-86D aircraft, Avionics, Trouble shooting, *Core training, On-the-job training.

The report is the third in a series of four reports describing the development of a core training course for electronic maintenance personnel. The study was specifically concerned with the family of electronic maintenance positions used by squadrons of the Air Defense Command in maintaining the F-86D aircraft. The present report presents a detailed description of the core training course developed for training skills and knowledges which exist in common among the positions. Other reports in the series summarize the study (3); describe the compilation of the skills and knowledges identified as common among the positions (1); and discuss the general principles and techniques for deriving courses of this type (2). The following section provides background information used in the design of the course. Appendix A presents detailed descriptions of the characteristics of the core training course, and Appendix B describes the recommended training equipment. (Author)
AD-669 399 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. IV. PRINCIPLES AND TECHNIQUES.
Technical memo.,
American Institutes for Research Pittsburgh Pa
Robert B. Miller, and John D. Folley, Jr. Jun 56, 29p
ML-LOWRY-TM-56-4
Contract AF 18 (600)-1351
See also ML-LOWRY-TM-56-1, AD-669 397.

Descriptors: (*Jet fighters, Maintenance), (*Electronic technicians, *Military training), Selection, Job analysis, Teaching methods, Management planning, Preparation, Aptitude tests, Fuel systems, Communication systems, Automatic pilots, Training devices, Aircraft fire control systems, Electronic equipment, Pattern recognition, Research program administration, Circuits, Navigation.
Identifiers: F-86 aircraft, F-86D aircraft, Avionics, Trouble shooting, On-the-job training, *Core training.

The major portion of this report is divided into two sections. The first of these sections is concerned with the major problem of the study and with the several procedural problems which were anticipated at the outset of the study. In the second of these sections is a technical description of the methods developed and applied during the project together with the principles which guided that development or which are derivable from the results. That section also includes specification of the assumptions made during the study. A concluding section suggests briefly some of the implications of the study with suggestions as to where further research in this area should be directed. (Author)
AD-669 400 HC$3.00 MF$0.65

BEHAVIOURAL PROBLEMS IN AEROSPACE MEDICINE.
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 6S.
AD-669 417 HC$3.00 MF$0.65

AERONAUTICAL CHART AND INFORMATION CENTER TECHNICAL TRAINING ACTIVITIES.
Aeronautical Chart and Information Center St Louis Mo
For primary bibliographic entry see Field 8B.
AD-669 421 HC$3.00 MF$0.65

ABSTRACTS OF TECHNICAL REPORTS PERSONNEL SURVEYS DIVISION JAN 1965-JAN 1968,
Naval Personnel Program Support Activity Washington D C Personnel Surveys Div
Robert W. Deimel. Feb 68, 23p Rept no. WRR-68-12

Descriptors: (*Naval personnel, Attitudes), Abstracts, Motivation, Decision making, Social psychology, Education, Officer personnel, Civilian personnel, Employment, Recruiting, Questionnaires.

This compilation of thirty-nine abstracts provides a concise summary of the research conducted by the Personnel Surveys Division since its inception in August 1964. Contained in each abstract are such basic information as sample size, characteristics of respondents, appropriate dates, the purpose of the survey, the methods used in conducting the study, and the major findings and conclusions. (Author)
AD-669 480 HC$3.00 MF$0.65

PUBLIC POLICY RESEARCH AND ADMINISTRATION: A PROPOSAL FOR EDUCATIONAL INNOVATION,
Rand Corp Santa Monica Calif
John Crecine, H. Ayers Brinser, R. Lee Brummet, Robert S. Friedman, and Floyd Mann. May 68, 22p Rept no. P-3824
Prepared in cooperation with Michigan Univ., Ann Arbor.

Descriptors: (*Education, *Management engineering), Professional personnel, Standards, Universities, Organizations, Decision making, Students, Instructors, Teaching methods.

The goal of the study is to develop a creative and innovative research and educational program in public policy and administration. It is believed that the program's integrity can best be assured by building from a well-formulated teaching plan in public administration leading toward a professional, graduate degree. The curriculum should also serve to define the boundaries for creative individual and group endeavors in research in public policy and in public administration. In order to attract or retain a staff of the quality necessary to fulfill these goals, ultimately there must be doctoral programs, interdepartmental or interdisciplinary in character, in which students are closely associated with the research activities of a public administration faculty. (Author)
AD-669 559 HC$3.00 MF$0.65

ENVIRONMENTAL EFFECTS REPORT FOR HELICOPTER INSTRUMENT TRAINER DEVICE 2B10A.
Melpar Inc Falls Church Va
For primary bibliographic entry see Field 1C.
AD-669 671 HC$3.00 MF$0.65

CRIMEAN UNDERWATER SCUBA PROJECT,
Joint Publications Research Service, Washington, D. C.

Galina Guseva. 30 Jan 68, 6p
Trans. from Sovetskaya Rossiya (USSR) p4 15 Oct 1967.

Descriptors: (*Scuba divers, Stress (Physiology)), Confined environments, Underwater, Black Sea, Recreation, Decompression, Laboratories, USSR, Biometry, Controlled atmospheres, Performance (Human), Underwater objects.

An expedition by the Donetsk Ikhtiandr Club to Laspi Bay on the South Coast of the Crimea has completed its work. For two weeks two groups of scuba divers have lived and worked in an underwater home located at a depth of 12 meters. The primary aim of the experiment was to determine the effect of increased pressure on the human organism. (Author)
JPRS-44179 HC$3.00 MF$0.65

AZERBAYDZHAN ACADEMY OF SCIENCES ELECTS NEW MEMBERS,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 5K.
JPRS-44193 HC$3.00 MF$0.65

UKRAINIAN EPIDEMIOLOGIST L. V. GROMASCHEVSKII HONORED,
Joint Publications Research Service, Washington, D. C.
Yurii Shcherbak. 14 Mar 68, 9p
Trans. of Literaturnaya Gazeta (USSR) n5 p12 1968.

Descriptors: (*Medical personnel, USSR), History, Epidemiology, Communists.
JPRS-44706 HC$3.00 MF$0.65

NEED FOR YOUTH IN SCIENCE.
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 5K.
JPRS-44773 HC$3.00 MF$0.65

SPACE RESOURCES FOR THE HIGH SCHOOL INDUSTRIAL ARTS RESOURCES UNITS.
National Aeronautics and Space Administration, Washington, D. C.
J. L. Feirer. Apr 67, 178p NASA-EP-44
Conf- Presented At the Space Technol. Conf. for Ind. Arts Educ.

Descriptors: *Aerospace engineering, *Education, *Nasa programs, Aerospace industry, Bibliographies, Manuals, Occupation, Technology utilization, Textbooks.

For abstract, see STAR 06 12.
N68-22336 HC$3.00 MF$0.65

PROGRAM FOR SELECTING FIRST-LINE FOREMEN,
Oak Ridge National Lab., Tenn.
G. F. R. Johnson, and C. L. Jaffee. Mar 68, 30p*
Contract W-7405-eng-26

Descriptors: (*Personnel management, Selection), Management planning, Standards, Performance (Human).

For abstract, see NSA 22 10.
ORNL-4231 HC$3.00 MF$0.65

THE NEGRO AND EQUAL EMPLOYMENT OPPORTUNITIES: A REVIEW OF MANAGEMENT EXPERIENCES IN TWENTY COMPANIES,
Michigan Univ., Ann Arbor. Inst. of Labor and Industrial Relations.
Louis A. Ferman. Dec 66, 200p*
Contract MDTA-7-64
Prepared in cooperation with Wayne State Univ., Detroit, Mich.

Descriptors: (*Employee relations, *Personnel management), Employment, Performance (Human), Performance tests, Job analysis, Labor, Industrial psychology, Civilian personnel, Industrial relations, Industrial training, Supervisory personnel, Industries.
Identifiers: Negroes.

Twenty companies were selected to study the application of equal employment practices in company settings and to assess the impact of these practices on minority group employment. Although the selection was not random, the companies represented a variety of employment structures and varied in size, number of branch units, geographical spread and product or service. The twenty studies represented in this report cover the broad spectrum of industrial classifications: heavy and light manufacturing; public utilities; service; retail and wholesale trade; transportation and distribution. All of the companies had publicly pledged themselves to a program of action in equal employment opportunity. (Author)
PB-176 721 HC$3.00 MF$0.65

A FEASIBILITY STUDY TO IDENTIFY THE UNDEREMPLOYED AND TO EXAMINE THE LABOR MARKET ATTACHMENT OF LABOR FORCE NONPARTICIPANTS IN A LOW-INCOME AREA,
Georgia Univ., Athens. Bureau of Business and Economicesearch.
Ethel B. Jones. 24 Jul 67, 94p*
Grant DL-91-11-66-46

Descriptors: (*Labor, *Employment), Manpower studies, Wages, Economics, Feasibility studies, Questionnaires, Time.
Identifiers: Underemployment.

The report presents and tests a household questionnaire designed to identify certain aspects of labor resource use not measured by unemployment (the usually employed indicator of labor resource utilization). The facets of labor resource use studied by the questionnaire are underemployment and nonparticipation in the labor force. The term 'underemployment' refers to work at low rates of pay, lost work time within the year due to labor market conditions, and work at a lower occupational level than the individual has indicated he is capable of doing as demonstrated by his past work record. The two aspects of labor force nonparticipation with which the questionnaire is concerned are seasonal work and discouraged work-seeking due to labor market conditions. The case study findings illustrate that underemployment (according to the definitions of the study) can be high when unemployment (measured according to usually used procedures) is low. Among a labor force of 140 persons, 5 are counted as underemployed while 40 are counted as 'underemployed.' Only 3 of the persons counted as underemployed experienced more than one aspect of underemployment. Among the three types of underemployment, the most frequently occuring one is work at low rates of pay. For males, the labor force participation rate observed in the study is above that prevailing nationally and the labor force participation rate of females is only slightly below the national rate. Hence, it is not too surprising that the study finds only one person outside of the labor force because of an attachment to seasonal work or discouraged work-seeking due to labor market conditions. (Author)
PB-177 559 HC$3.00 MF$0.65

AN INVESTIGATION OF THE UTILIZATION OF THE MANPOWER SKILLS OF THE 1964 GRADUATING CLASS OF GRAMBLING COLLEGE.
Grambling Coll., La.
1965, 198p
Grant DL-91-17-03

Descriptors: (*Employment, *Education), Manpower studies, Labor, Professional personnel, Instructors, Economics, Personnel management, Wages.
Identifiers: Negroes, Grambling College.

The purpose of the study was to determine the extent to which the skills and competencies of the Grambling College graduates, class of 1964, were being maximally used in the national economy. The significance of the findings lay in (1) their potential for stimulating private and public employers to analyze their employment programs and practices toward the end of greater utilization of the available manpower; (2) the factual data which can be used by Grambling College to analyze its curricula in terms of national need and (3) their potential use in academic and vocational counseling relevant to incipient employment patterns and possibilities. (Author)
PB-177 560 HC$3.00 MF$0.65

EMPLOYMENT PATTERN OF XAVIER UNIVERSITY GRADUATES OF 1964,
Xavier Univ., New Orleans, La. Placement Office.
Lois G. Taplin. 1967, 52p
Grant DL-91-17-04

Descriptors: (*Employment, *Education), Universities, Professional personnel, Selection, Manpower studies, Labor, Distribution, Statistical data, Sociometrics.
Identifiers: Negroes, Xavier University.

The report reflects the high percentage of women in the predominantly Negro college with specific 'pin-pointing' of this fact in the Department of Education. It accounts also for the fact that Education is still the top career choice. (The enrollment percentage of male graduates show a relatively consistent status in all fields). Except for the Department of Education, all other departments indicate an even spread in both male and female graduates with a good variety of disciplines represented. Family ties or stability of family in 1964 graduates indicate a wholesome picture. 66% show mother and father combination. In further substantiation of the matriarchal image of the Negro family which the 1964 graduating class perpetuales, survey shows the mother of graduates with the highest level of formal training in the family. Male image in the family is not of the professional status. (Negro male student in college must find motivational aspect outside of the family). High school teachers and counselors make up less than half of total influence on career choices. Females in 1964 class already earning more than total income of family. (Motivation of female increases in low income family to pursue professional occupation). Graduates as a rule remain in geographical area - Louisiana. Recruiting efforts by companies or agencies with recruiters who are non-Negro, as obvious from table 33, indicate that the recruiter does not have to be of any particular ethnic background. (Author)
PB-177 561 HC$3.00 MF$0.65

INFORMATION MANAGEMENT STUDY OF THE SELECTION AND ASSIGNMENT SYSTEM OF THE JOB CORPS.
Information Management Associates, Inc., Silver Spring, Md.
1 Mar 66, 85p
Contract OEO-1205

Descriptors: (*Adolescents, Training), (*Management planning, Reports), Operations research, Processing, Medicine, Records, Flow charting, Control systems, Microfilm, Systems engineering, Programming (Computers), Information retrieval.
Identifiers: Job Corps.

The document contains reports on the processing of enrollees and the handling of their records.
PB-177 741 HC$3.00 MF$0.65

INSTRUCTOR'S MANUAL. THE WHY WORK SERIES.
Final rept. 1 Nov 65-30 Apr 66,
Behavioral Research Labs., Palo Alto, Calif.
Gordon Lish. 30 Apr 66, 31p
Contract OEO-721

Descriptors: (*Instruction manuals, Employment), (*Employment, Motivation), Training, Behavior, Attitudes.
Identifiers: Jobs Corps.

As Job Corps centers were opened and actual training procedures were set in motion, it became clear to his counselors that the Corpsman's attitude toward acquiring and holding a job would largely determine his ultimate employability. It was agreed that unless the Corpsman were re-oriented to view work as a highly desirable and satisfying experience, the effort and expenditure invested in his months of training would be fundamentally wasted. It was understood that the success of the Corpsman's Job Corps training must eventually depend upon the degree to which the Corpsman holds an affirmative attitude toward work. It was also seen that without such an attitude, the chances of the Corpsman's resigning from the program prior to his having completed sufficient training would remain high. The task, then, is to inspire in the Corpsman a set of attitudes such that he will be motivated to complete his Job Corps training satisfactorily and, thereafter, to seek appropriate work aggressively. (Author)
PB-177 743 HC$3.00 MF$0.65

FOLLOW-UP SURVEY OF JOB CORPS GRADUATES.
Final rept. 1 Jun-1 Aug 66,
Opinion Research Corp., Princeton, N. J.
Ronald D. Wynne, and Caroline Morris. Sep 66, 15p*
Contract OEO-1302

Descriptors: (*Employment, *Retraining), (*Manpower studies, New Jersey), Education, Training, Wages, Attitudes, Job analysis, Money, Human engineering, Sampling, Questionnaires.
Identifiers: Job Corps graduates.

The Opinion Research Corporation (ORC) mailed questionnaires to the 1474 former Job Corps men and women who were placed on jobs or in school, as of May 31, 1966. The present report is based on the returns of 465 of these youth, or 32% of the total population. The population being sampled represents all job or school placements, on whom Job Corps had a completed form JC 72 through May 31: this is the Verified Placement form, completed either by the Placement Officer in the centers or by the Placement Division in the OEO Regional Offices, and then sent on to Washington. There is often a time lag between a Corpsmen's leaving his center and being placed on the job, and an additional time lag between his placement and the arrival of the JC 72 in Washington. Therefore, the verified placements through May 31 (1474) fall short of the total number of youth who had been placed as of that time. The subjects sampled are not all 'graduates' of Job Corps, though for convenience they will be called graduates in this paper. A youth does not need to be an actual graduate to receive placement assistance, and a number of the youth whose results are considered here did, in fact, resign from the program. (Author)
PB-177 755 HC$3.00 MF$0.65

SURVEY OF JOB CORPS GRADUATES: A DESCRIPTIVE STUDY OF WORKING JOB CORPS GRADUATES.
Final rept. 14 Jan-31 Jan 66.
Opinion Research Corp., Princeton, N. J.
6 Feb 68, 18p
Contract OEO-938

Descriptors: (*Manpower studies, Statistical analysis), Transfer of training, Personnel, Job analysis, Employment, Culture, Interactions, Wages, Performance (Human), Motivation, Questionnaires.
Identifiers: Job Corps.

As part of the continuing evaluation of its programs, Job Corps commissioned the Opinion Research Corporation to conduct a follow-up study of a sample of male Job Corps graduates who have entered the labor force: of the first 319 working graduates, 86, or 27% were contacted and interviewed. The present paper discusses the findings of this study, and deals with some of its implications for Job Corps policies and practices.
PB-177 757 HC$3.00 MF$0.65

MIGRANT LABOR AS A FORM OF INTERMITTENT SOCIAL ORGANIZATION AND AS A CHANNEL OF GEOGRAPHICAL MOBILITY,
New York State School of Industrial and Labor Relations, Ithaca.
For primary bibliographic entry see Field 5K.
PB-177 867 HC$3.00 MF$0.65

AN INVESTIGATION OF THE UTILIZATION OF THE MANPOWER SKILLS OF THE 1964 GRADUATING CLASS OF DILLARD UNIVERSITY,
Dillard Univ., New Orleans, La.
Daniel C. Thompson. 1967, 124p
Grant DL-91-17-03

Descriptors: (*Manpower studies, *Education), Culture, Interactions, Sociology, Economics, Motivation, Attitudes, Instructors, Questionnaires, Statistical analysis.

This study was initiated by the United States Department of Labor, under the Manpower Development and Training Act. It was intended as a summer project. Only two, overlapping, research instruments were used: One, a list of questions to be answered from information found in the students' college files, and two, a formal questionnaire that was mailed to each graduate in the Class of 1964. All questions included in the questionnaire are believed to be relevant to the occupational success or failure of the graduates.
PB-177 871 HC$3.00 MF$0.65

THE IMPACT OF DEFENSE CONTRACT TERMINATION ON THE LABOR FORCE,
Arizona Univ., Tucson.
For primary bibliographic entry see Field 5C.
PB-177 873 HC$3.00 MF$0.65

EXTENDING EMPLOYMENT IN THE PEACH INDUSTRY THROUGH BETTER MARKETING AND MORE PROCESSING.
Georgia Experiment Station, Experiment.
For primary bibliographic entry see Field 5C.
PB-178 026 HC$3.00 MF$0.65

SCIENCE INFORMATION SPECIALIST TRAINING PROGRAM.
Progress rept.,
George Washington Univ., Washington, D. C. Biological Sciences Communication Project.
Charles W. Shilling, and Bruce Berman. Mar 68, 31p* BSCP-28-68

Descriptors: (*Documentation, Training), Personnel, Information retrieval, Education, Universities, Management engineering, Data processing systems, Wages.
Identifiers: Information specialists, Information technology.

The Biological Sciences Communication Project (BSCP) believes the best attack on the problem of the explosive growth of scientific information is through education and training of science information specialists. Such specialists, trained to keep up-to-date on sources of new information, to develop controls and systems for information flow, to provide research scientists with surveys in their fields of interest are true communication scientists in the research team. To make them most effective, such specialists should have knowledge of: some area of scientific subject matter, information handling, sources of information, and such information services as abstracting, indexing, and translation programs. A number of industries, universities and research institutes have already established positions for such specialists, but very few have undertaken the kind of training that will yield properly qualified individuals to hold these positions. It was in this frame of reference that BSCP, early in 1962, submitted to the Division of General Medical Sciences of the National Institutes of Health, a proposal for support of a program to train four graduate-level students to become information specialist administrators in the biological and medical sciences. BSCP was awarded a two-year grant. The training program was in two parts: (1) intensive formal study at the American University in Washington, D. C.; (2) on-the-job training at BSCP. (Author)
PB-178 072 HC$3.00 MF$0.65

COMPUTER SCIENCE AND EDUCATION.
Technical rept.,
tanford Univ., Calif. Dept. of Computer Science.
George E. Forsythe. 27 Mar 68, 53p CS-93

Descriptors: (*Education, *Data processing systems), Costs, Management planning, Computers, Automation, Libraries, Computer personnel, Universities, Teaching methods.
Identifiers: Computer-aided instruction.

Computing and education intersect in two main ways: computing for education, and education about computing. In the former category are discussed studies of resource allocation, detailed administration, school scheduling, automated examination scoring, creation of demonstration problems, library organization, and computer-assisted instruction. Education about computing is discussed under these headings: the demand for computer education, what is computer science and who should teach it, the preschool and primary school, secondary school, university, doctoral-level education, adult education, computer system requirements, education of computer technicians, and activities of the professional societies. There is a brief look at future problems and opportunities. (Author)
PB-178 115 HC$3.00 MF$0.65

5J. Psychology (Individual and Group Behavior)

A SURVEY OF ELITE STUDIES.
American Univ., Washington, D. C. Special Operations Research Office.
For primary bibliographic entry see Field 5D.
AD-464 906 HC$3.00

PSYCHOLOGICAL AND PSYCHOTHERAPEUTIC ASPECTS OF SWIM COACHING,
Navy Medical Neuropsychiatric Research Unit San Diego Calif
Ransom J. Arthur. 1967, 13p Rept no. NMNRU-67-15
Availability: Published in The Journal of Sports Medicine and Physical Fitness, v7 n4 p185-91 Dec 1967.

Descriptors: (*Swimming, *Applied psychology), Instructors, Performance (Human), Training, Therapy, Adjustment (Psychology), Stress (Psychology), Physical fitness, Behavior, Personality, Psychiatry.

The lessons that competitive swimming can impart to those concerned with human behavior are several. Most importantly, swimming teaches that one can always do better than he thinks he can, if he is willing to make the necessary sacrifices. Too often the psychiatric profession expects too little of its patients. They, too, can often do better than either we or they think. It is a challenge in psychotherapy to assess the power of the patient's ego functioning and the limits of what he can achieve and how much he can grow. The danger of overtaxing his resources, particularly in the psychotic, is great. However, so often in psychotherapeutic work we do the patient a disservice by indicating that in view of his wretched past life or upbringing he cannot be expected to do anything well. This can be a self-fulfilling prophecy no less for a patient than for an athlete. Swimming teaches

the relationship between effort, meticulous preparation and results. Finally, it teaches that courage, grace, and fortitude, unpopular concepts though they are today, still do credit to the humans who display them. (Author)
AD-669 225 Not available from CFSTI.

INCREMENT THRESHOLDS ON BLACK BARS.
Technical rept.,
Columbia Univ New York Psychophysics Lab
Davida Y. Teller. 1 Mar 68, 18p Rept no. PLR-3
Contract DADA17-68-C-8065
Prepared in cooperation with Washington Univ., Seattle. Dept. of Psychology, Contract DA-49-193-MD-2713.

Descriptors: (*Visual perception, Psychophysics), Thresholds (Physiology), Adaptation (Physiology), Retina, Vision, Experimental design.

Under conditions that isolate rod vision, increment thresholds were measured on black bars of various widths, and compared to the increment threshold measured on a homogeneously illuminated field without the bar. Thresholds were found to be elevated in the presence of bars in the vicinity of 10 feet of arc wide. However, this effect does not occur when the retinal images of adapting and test fields are stabilized. (Author)
AD-669 245 HC$3.00 MF$0.65

ASYMPTOTICALLY EFFICIENT SIMULTANEOUS ESTIMATION OF SEVERAL PARAMETERS.
Technical rept.,
Columbia Univ New York Psychophysics Lab
John van Laer. 15 Jan 68, 27p Rept no. PLR-2
Contract DADA17-68-C-8065

Descriptors: (*Psychometrics, Statistical analysis), Statistical tests, Statistical distributions, Mathematical prediction, Mathematical models, Sampling, Probability, Matrix algebra, Numerical analysis.
Identifiers: Maximum likelihood, Asymptotic distributions, Probability distributions.

In a chi - square test of goodness of fit of data to a theoretical model, the estimators of the parameters of the model must be asymptotically efficient. A method (described by W. H. Kruskal) of converting a consistent but inefficient estimator into one that is asymptotically efficient is extended to the case of simultaneous estimation of several parameters. The method is exhibited in a single formula. However, to render the formula intelligible and to motivate and prove the method necessitates derivation in detail of certain characteristics of RBAN estimators of parameters that underlie multinomial distributions. (Author)
AD-669 246 HC$3.00 MF$0.65

SELF-REGULATION OF HIGHER NERVOUS ACTIVITY,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6P.
AD-669 273 HC$3.00 MF$0.65

SITUATIONAL CONDITIONED REFLEXES IN DOGS IN NORMAL AND PATHOLOGICAL STATES,
Foreign Technology Div Wright-Patterson AFB Ohio
P. S. Kupalov, O. N. Voevodina, V. D. Volkova, I. V. Malyukova, and A. T. Selivanova. 18 Oct 67, 290p Rept no. FTD-HT-23-810-67
Unedited rough draft trans. of mono. Situatsionnye Uslovnye Refleksy u Sobak v Norme i Patologii, Leningrad, 1964 275p.

Descriptors: (*Conditioned reflex, *Laboratory animals), Environmental tests, Behavior, Stimulation, Motivation, Reaction (Psychology), Adjustment (Psychology), Psychotropic agents, Whole body irradiation, USSR.
Identifiers: Behavior (Animals), Translations.

This monograph presents the results of many years of research on regularities in animal behavior by the conditioned-reflex method. A great deal of attention is paid to complex conditioned motor reflexes induced in response to auditory and visual stimuli, taking into account their spatial localization and the spatial position of the animal itself. Use of various drugs, extirpation and transection at different cerebral levels, and X-irradiation enabled the authors to elucidate both the dynamics and structure of the forms of motor activity they studied. These data are of both theoretical and practical importance.
AD-669 274 HC$3.00 MF$0.65

COMPUTER-BASED INSTRUCTION: PSYCHOLOGICAL ASPECTS AND SYSTEMS CONCEPTION OF INSTRUCTION.
Harvard Computing Center Cambridge Mass
For primary bibliographic entry see Field 5I.
AD-669 287 Not available from CFSTI.

INVESTIGATION OF THE EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE WITH A NASA PROTOTYPE APOLLO HELMET.
Aerospace Medical Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6S.
AD-669 357 HC$3.00 MF$0.65

THE DEVELOPMENT OF PSYCHOLOGICAL MODELS FOR SPEECH RECOGNITION.
Massachusetts Inst of Tech Cambridge Dept of Psychology
For primary bibliographic entry see Field 5G.
AD-669 360 HC$3.00 MF$0.65

DISTRIBUTION OF PRACTICE AND THE MULLER-LYER ILLUSION,
Calgary Univ (Alberta)
Robert E. Dewar. 1968, 3p
Availability: Published in Perception and Psychophysics, v3 (4a) p246-8 1968.

Descriptors: (*Visual perception, Illusions), Learning, Psychophysics, Performance (Human), Training, Canada.

Two experiments were conducted to determine the influence of distribution of practice on the decrement of the Muller-Lyer illusion. In the first experiment, Ss judged the illusion figure 100 times per session in five sessions separated by intervals of seven days. In the second, Ss judged the figure 200 times in a single session. The data were compared with those from an earlier experiment (Dewar, 1967) in which Ss judged the figure 100 times per session in five sessions separated by 24 h. In all three experiments two configurations of the illusion were used--one with a 60 degree angle between the oblique lines and one with a 120 degree angle. The distribution of practice did not influence the decrement of the illusion for the 120 degree figure. The only effect of this variable was to produce a more rapid practice decrement for the 60 degree figure when sessions of 100 trials were separated by a 24-h interval. (Author)
AD-669 404 Not available from CFSTI.

EFFECTS OF SENSORY AND PERCEPTUAL DEPRIVATION ON A BATTERY OF OPEN-ENDED COGNITIVE TASKS,
Manitoba Univ Winnipeg Dept of Psychology
Kurt Fuerst, and John P. Zubek. 1968, 10p
Availability: Published in Canad. J. Psychol./Rev. Canad. Psychol v22 n2 p122-30 1968.

Descriptors: (*Sensory deprivation, Performance (Human)), Reasoning, Auditory perception, Visual perception, Statistical analysis.
Identifiers: *Cognition.

Two experiments were conducted to test the hypothesis, advanced by several investigators, that performance on open-ended cognitive tests will be impaired by exposure to an impoverished sensory environment. The Guilford battery of creative thinking (10 tests) was administered before and at the end of three days of either sensory deprivation (darkness and silence) or perceptual deprivation (unpatterned light and white noise). In both experiments, no significant differences were found between the isolated and control Ss on any of the ten cognitive tests. However, when the data of the two experiments were combined, the isolated Ss performed significantly worse than did the controls on a test of ideational fluency. In a further analysis of the data, it was observed that the pre-experimental scores of a group of six isolation quitters were consistently lower, relative to those of the successful isolation endurers and control Ss, on all ten tests of the Guilford battery. Although none of the differences were statistically significant, probably because of the small sample of quitters, the results suggest that low pre-experimental scores on open-ended cognitive tests may be indicative of isolation intolerance. (Author)
AD-669 409 Not available from CFSTI.

STUDIES OF THE NAVAL FACILITIES ENGINEERING COMMAND PROTECTIVE SHELTER. II. SUMMER TRIALS.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 13M.
AD-669 448 HC$3.00 MF$0.65

PLANNING AND ANALYSIS OF NON-EXPERIMENTAL STUDIES.
Harvard Univ Cambridge Mass Dept of Statistics
For primary bibliographic entry see Field 5K.
AD-669 462 HC$3.00 MF$0.65

THE EFFECT OF THE LABORATORY SITUATION ON EXPERIMENTAL DISCUSSION GROUPS.
Technical rept.,
Duke Univ Durham N C
Stephen R. Wilson. Nov 67, 40p Rept no. TR-26
Contract Nonr-1181 (11)

Descriptors: (*Social communication, *Group dynamics), Social psychology, Interactions, Sociometrics, Behavior, Attitudes, Experimental design.

The study attempts to determine the effect of the presence of an observer and the saliency of the experimental task upon laboratory discussion groups. Five groups of five subjects each were assigned to each cell of a two by two design (1. observer present versus observer absent; and 2. task used versus task not used). The observed-task not used condition was designed to resemble the 'typical' experimental situation. The strongest differences were found across the observed-not observed conditions. Observed groups had higher rates of task-oriented interaction and lower rates of task-irrelevant interaction, but no difference was found in actual productivity. Differentiation between the sociometric dimensions of best idea rankings and liking rankings was greater in the not observed condition. This was attributed to the greater variation in interaction content in this condition. The methodological implication of the results is discussed and the results are used to interpret the findings of other studies dealing with the development of experimental discussion groups over time. (Author)
AD-669 467 HC$3.00 MF$0.65

STUDY OF WORK-PRODUCING CHARACTERISTICS OF UNDERWATER OPERATIONS.
Final rept. 15 May 67-14 May 68,
North American Rockwell Corp Downey Calif Space Div
I. Streimer, D. P. W. Turner, and K. Volkmer.
May 68, 39p* Rept no. SD-68-347
Contract N00014-67-C-0363

Descriptors: (*Scuba divers, Performance tests), Underwater, Environmental tests, Marine engineering, Performance (Human), Correlation techniques, Terrain, Biometry, Test methods, Sequences, Sensors, Electrocardiography, Skin, Temperature, Thermistors, Anthropometry, Tables.

The work output characteristics of divers were tested during the performance of manual tasks which generally fell into three classifications: (1) A complex maintenance task involving the disassembly and reassembly of a water filtration unit. (2) A simple repetitive rotary task requiring continuous torque production against known resistances. (3) A simple repetitive discontinuous flexion/extension task requiring the exertion of linear forces against known resistances. During the task execution, heart rate and three skin temperatures were continuously monitored and electronically recorded. The underwater results were compared with performance values obtained from these tasks executed in normally tractive 'dry' environments and the observed decrements discussed in terms of biomechanical considerations and certain water effects. (Author)
AD-669 512 HC$3.00 MF$0.65

HOW PREDICTABLE ARE NEGOTIATIONS,
Hawaii Univ Honolulu Dept of Sociology
Otomar J. Bartos. 17 May 68, 19p
AFOSR-68-0996
Grant AF-AFOSR-62-314
Prepared in cooperation with Pittsburgh Univ., Pa.
Availability: Published in The Journal of Conflict Resolution, v11 n4 p481-96 Dec 1967.

Descriptors: (*Bargaining, Behavior), Social psychology, Performance (Human), Predictions, Game theory, Problem solving, Experimental design, Attitudes.

The report summarizes experiments which indicate that negotiation behavior, under some circumstances, is quite unstable; that it is very easy to alter the relationship between a negotiator's background and his performance. Experiments were performed in which some negotiators were told that their opponents were tough, others that they were soft, and still others were given no information at all. Resulting findings are discussed. (Author)
AD-669 537 Not available from CFSTI.

SUBJECTIVE AND ELECTROMYOGRAPHIC ASSESSMENT OF ISOMETRIC MUSCLE CONTRACTIONS.
Army Medical Research Lab Fort Knox Ky
For primary bibliographic entry see Field 6P.
AD-669 595 HC$3.00 MF$0.65

INCREASING TEAM PROFICIENCY THROUGH TRAINING: 7. THE SIMULATION OF TEAM ENVIRONMENTS.
Technical rept.,
American Institutes for Research Pittsburgh Pa Team Training Lab
Jerry G. Short, Timothy Cotton, and David J. Klaus. May 68, 65p Rept no. AIR-E1-5/68-TR
Contract Nonr-2551 (00)
See also Part 6, AD-471 470.

Descriptors: (*Group dynamics, Training), Behavior, Performance (Human), Simulation, Efficiency, Interactions, Reaction (Psychology), Social psychology.
Identifiers: Reinforcement (Psychology).

Three studies of simulated team environments are described in the report. Each study dealt in some way with the transition performance decrement that occurs when individuals are placed in teams. Study 1 found that this decrement was, in a large part, a function of the change in reinforcement ratio that occurred between individual and team training. Study 2 showed that reinforcement in the team environment was a function of characteristics of the team members themselves--their number and the proficiencies. An increase in the number of team members or a decrease in their proficiency produced lower reinforcement ratios and these in turn produced larger decrements in performance and increased the time required for teams to reach high levels of proficiency. Study 3 showed that the transition performance decrement could be reduced by certain training strategies notably those involving a simulation of the team environment during individual training. (Author)
AD-669 687 HC$3.00 MF$0.65

INCREASING TEAM PROFICIENCY THROUGH TRAINING.
Summary rept. no. 8 (Final),
American Institutes for Research Pittsburgh Pa Team Training Lab
David J. Klaus, and Robert Glaser. May 68, 65p Rept no. AIR-E1-6/68-FR
Contract Nonr-2551 (00)
See also Part 7, AD-669 687.

Descriptors: (*Group dynamics, Training), Behavior, Performance (Human), Learning, Feedback, Efficiency, Simulation, Interactions, Reaction (Psychology), Social psychology.

The report summarizes the results of research at the Team Training Laboratory from December 1960 until August 1967. During this time seven technical reports were issued by the laboratory. This summary report briefly describes each of these seven studies and reviews their purpose and major results. The final section of this report identifies some practical implications of this research and relates the underlying concepts to the broader context of social behavior. (Author)
AD-669 688 HC$3.00 MF$0.65

REVIEW OF LITERATURE ON THE COACTION BETWEEN SOCIAL GROUPS AND PHYSICAL ENVIRONMENT,
Ohio State Univ. Research Foundation, Columbus.
Henry S. Brinkers, and Joseph T. Crymes. Jan 68, 87p*

Descriptors: (*Group dynamics, Documentation), (*Sociometrics, Environment), Reaction (Psychology), Research program administration, Performance (Human), Measurement, State-of-the-art reviews, Models (Simulations), Statistical processes, Colors, Sound, Configuration, Positioning reactions, Theory.
Identifiers: Isolation.

The document is a report on the review of research literature dealing with the coaction between social groups and physical environment. The report presents (1) a synopsis of the relevant research on the subject, (2) annotations of twenty-nine of the most significant research publications, and (3) a classified bibliography of 141 publications. The objective of the review was to assemble research findings on the definition and significance of social and environmental variables, on theory explaining the ways in which these variables are interrelated, and on the means by which socio-environmental conditions may be measured and evaluated. (Author)
PB-177 840 HC$3.00 MF$0.65

QUANTITATIVE CHARACTERISTICS OF ACTION POTENTIALS OF THE SOMA OF THE GIANT NEURONS OF THE MOLLUSK PHANORBIS CORNEUS DURING SPONTANEOUS PHYTHMIC DISCHARGE,
Federation of American Societies for Experimental Biology, Bethesda, Md.
For primary bibliographic entry see Field 6P.
PB-178 052T HC$3.00 MF$0.65

IMPORTANCE OF PAIRED FUNCTION OF THE HEMISPHERES IN ANALYSIS OF MOVING STIMULI,
Federation of American Societies for Experimental Biology, Bethesda, Md.
For primary bibliographic entry see Field 6P.
PB-178 053T HC$3.00 MF$0.65

CONDITIONED REFLEXES IN THE BAIKAL PLANARIAN PODOPLANA OLIVACEA K. AFTER INJECTION OF RIBONUCLEASE,
Federation of American Societies for Experimental Biology, Bethesda Md.
For primary bibliographic entry see Field 6P.
PB-178 054T HC$3.00 MF$0.65

ANALYSIS OF FUNCATIONAL ORGANIZATION OF CONDITIONED AVOIDANCE REFLEXES,
Federation of American Societies for Experimental Biology, Bethesda, Md.
For primary bibliographic entry see Field 6P.
PB-178 055T HC$3.00 MF$0.65

PROGRESS REPORT 49, 1 JULY - 31 DECEMBER 1967.
Harvard Univ., Cambridge, Mass. Lab. of Psychophysics.
31 Dec 67, 19p PPM-117
Grants NSF-GB-3211, PHS-NB-02974

Descriptors: (*Sensory perception, Psychophysics), (*Psychophysics, Reports), Touch, Nervous system, Auditory perception, Auditory nerve, Visual perception, Afterimages, Color vision, Taste, Noise, Viscosity, Brightness, Hysteresis.

Contents: Tactile vibration--Change of exponent with frequency; Neural correlates of the aural combination tone 2f sub 1 - f sub 2; Perceptual invariance and the psychophysical law; Relation between tuning curves and click latency times in auditory nerve fibers; Cochlear phenomenological model; Effect of noise bandwidth on the loudness of 1000-Hz tome; Asymmetry of masking between noise and a 1000-Hz tone; A new perceptual image; Persistent color aftereffects produce by moving contours; Further studies of the McCollough effects; Cross modality matching between sweetness and the continua of number and loudness; The sweetness function as affected by viscosity; Sweetness selection as a procedure for cross-modality matching; Neural quantum in vision; Brightness of a small light source; Hysteresis and poststimulus effects.
PB-178 112 HC$3.00 MF$0.65

5K. Sociology

TELEVISED OMBUDSMAN,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 17B.
AD-669 319 HC$3.00 MF$0.65

ABOUT THE 'HISTORICAL' AND THE 'LOCAL' LEGEND AND THEIR RELATIVES,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5G.
AD-669 338 HC$3.00 MF$0.65

CONFERENCE ON CHINESE DATA RETRIEVAL HELD AT THE RAND CORPORATION, FEBRUARY 2-3, 1968,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5B.
AD-669 339 HC$3.00 MF$0.65

PLANNING AND ANALYSIS OF NON-EXPERIMENTAL STUDIES.
Technical rept.,
Harvard Univ Cambridge Mass Dept of Statistics

Group 5K—Sociology

W. G. Cochran. 26 Apr 68, 30p Rept no. TR-19
Contract Nonr-1866 (37), Grant NSF-GS-341
See also Technical report no. 10, AD-644 017.

Descriptors: (*Population, Statistical analysis), Performance (Human), Group dynamics, Behavior, Biometry, Accuracy, Correlation techniques, Regression analysis, Sampling, Uncertainty.

The paper deals with statistical studies of human populations designed to investigate either analytical relationships among a number of variables or subgroups in the population, or some more specific cause-and-effect relationship (e.g., seat belts and injuries in auto accidents). Such studies are called non-experimental in the sense that the investigator cannot apply the causal agent to randomized groups of people. The three topics discussed are (i) preliminary aspects of planning, (ii) some simple types of study plan and analysis, and (iii) techniques for increasing precision and guarding against bias. (Author)
AD-669 462 HC$3.00 MF$0.65

TRADITIONAL MEDICINE IN MODERN CHINA: SCIENCE, NATIONALISM, AND THE TENSIONS OF CULTURAL CHANGE.
Harvard Univ Cambridge Mass East Asian Research Center
For primary bibliographic entry see Field 6E.
AD-669 505 Not available from CFSTI.

AREA HANDBOOK FOR COMMUNIST CHINA,
American Univ Washington D C Foreign Area Studies Div
For primary bibliographic entry see Field 8F.
AD-669 528 MF$0.65

HOW PREDICTABLE ARE NEGOTIATIONS,
Hawaii Univ Honolulu Dept of Sociology
For primary bibliographic entry see Field 5J.
AD-669 537 Not available from CFSTI.

SHIP WAVES AT RECREATIONAL BEACHES,
California Univ Berkeley Hydraulic Engineering Lab
For primary bibliographic entry see Field 20D.
AD-669 585 HC$3.00 MF$0.65

1966 ACTIVITIES OF LITHUANIAN SCIENCE INSTITUTIONS.
Joint Publications Research Service, Washington, D. C.
26 Jan 68, 24p
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n3 (50) p151-62 1967.

Descriptors: (*Universities, USSR), (*Education, USSR), Chemical engineering, Chemistry, History, Power, Physics, Electrical engineering, Mathematics, Geography, Nuclear physics.
Identifiers: Lithuania.
JPRS-44154 HC$3.00 MF$0.65

AZERBAYDZHAN ACADEMY OF SCIENCES ELECTS NEW MEMBERS,
Joint Publications Research Service, Washington, D. C.
R. G. Ismailov. 30 Jan 68, 8p
Trans. of Bakinskii Rabochii (USSR) p3 29 Dec 1967.

Descriptors: (*Scientific organizations, USSR), Scientific personnel, Instructors, Chemistry, Semiconductors, Geology, Genetics, Pathology, Law, Computers, Medicine, USSR.
Identifiers: Azerbaydzhan Academy of Sciences.
JPRS-44193 HC$3.00 MF$0.65

ELECTRICAL ENGINEERING FACILITY OF CZECH ADVANCED SCHOOL OF TECHNOLOGY IN PRAGUE,
Joint Publications Research Service, Washington, D. C.
Josef Eichler. 1 Feb 68, 6p
Trans. of Ceskoslovenske Spoje, v12 n6 p20-1 1967.

Descriptors: (*Education, Czechoslovakia), (*Electrical engineering, Education), Training, Television transmitters, Motion pictures, Radio equipment, Technicians.
JPRS-44227 HC$3.00 MF$0.65

PEOPLE'S CONTROL GROUPS IN SOVIET SCIENTIFIC INSTITUTIONS,
Joint Publications Research Service, Washington, D. C.
B. Paton. 8 Mar 68, 5p
Trans. of Pravda, Moscow (USSR) p3 17 Nov 1967.

Descriptors: (*Scientific organizations, *Management control systems), Management engineering, Communism, Scientific personnel, Costs, Training, Growth, USSR.
JPRS-44616 HC$3.00 MF$0.65

OLD BOLSHEVIKS DENOUNCE HISTORICAL REVISIONISM IN THE USSR.
Joint Publications Research Service, Washington, D. C.
13 Mar 68, 15p
Trans. of Bandiera Rossa (Italy) p3-4 15 Dec 1967.

Descriptors: (*Sociology, USSR), History, Communism, Propaganda, Symposia, Communists.
JPRS-44658 HC$3.00 MF$0.65

PROBLEMS OF SCIENCE PLANNING IN BULGARIA,
Joint Publications Research Service, Washington, D. C.
Petur Velkov. 14 Mar 68, 14p
Trans. of Planovo Stopanstvo i Statistika (Bulgaria) n10 p3-11 1967.

Descriptors: (*Management planning, *Scientific research), Economics, Personnel, Growth, Sociology, Technicians, Communism, Research program administration, Bulgaria.
JPRS-44723 HC$3.00 MF$0.65

NEED FOR YOUTH IN SCIENCE.
Joint Publications Research Service, Washington, D. C.
21 Mar 68, 6p
Trans. of Pravda Vostoka (USSR) p1 13 Jan 1968.

Descriptors: (*Manpower, *Scientific personnel), Scientific research, Scientific organizations, Education, Training, Propaganda, Adolescents, USSR.
JPRS-44773 HC$3.00 MF$0.65

A COMPARATIVE ANALYSIS OF THE IMPACT OF VARIOUS TYPES OF CURRICULA ON THE VOCATIONAL SUCCESS OF SCHOOL DROPOUTS.
Doctoral thesis,
Oklahoma State Univ., Stillwater. Graduate Coll.
Gerald Eugene Boggs. May 67, 111p
Contract DL-91-38-66-50

Descriptors: (*Education, Sociometrics), (*Adjustment (Psychology), Education), Personnel, Job analysis, Transfer of training, Motivation, Adjustment (Psychology), Decision making, Performance (Human), Performance tests, Attitudes, Manpower studies, Statistical tests, Measure theory, Questionnaires, Oklahoma, Theses.
Identifiers: MDTA Program (Manpower Development Training Act), School dropouts.

This dissertation is concerned with an investigation of differences in selected measures of vocational success between experimental and control groups of the 1964-65 School Dropout Rehabilitation Project in Oklahoma City, Oklahoma. The selected measures of vocational success, as operationally defined, are entry into the labor market, employment status, number of jobs held, number of days employed, weekly wages, job performance, and job satisfaction.
PB-177 776 HC$3.00 MF$0.65

SOCIAL PSYCHOLOGICAL FACTORS ASSOCIATED WITH RESPONSES TO RETRAINING.
Final rept.,
West Virginia Center for Appalachian Studies and Development, Morgantown.
Robert W. Miller, and Frederick A. Zeller. Sep 67, 83p*
Grant DL-91-52-66-56
Prepared in cooperation with Saint Lawrence Univ.

Descriptors: (*Social psychology, Performance (Human)), (*Manpower studies, *Transfer of training), Rural areas, Geography, Economics, Employment, Coal, Agriculture, Education, Behavior, Attitudes, Motivation, Construction, Labor unions, Job analysis, Mobility, Statistical tests, Questionnaires, West Virginia.
Identifiers: Appalachia.

The chief aims of this study were to describe the post-training labor market behavior and experiences of the graduates of the training project, and explore possible associations between these responses to retraining and selected demographic and social psychological variables. Pursual of these aims through contracts with the graduates of this particular training project provided an opportunity to examine the nature of several specific important problem areas within the field of manpower development.
PB-177 864 HC$3.00 MF$0.65

AN EXPLORATORY STUDY OF DOMESTICS' VIEW OF THEIR WORKING WORLD. AN INQUIRY INTO THE METHODOLOGY OF A RESEARCH DESIGN FORMULATED TO GATHER INFORMATION FOR A MORE EXTENSIVE INVESTIGATION,
New York Univ., N. Y. School of Education.
For primary bibliographic entry see Field 5A.
PB-177 865 HC$3.00 MF$0.65

MIGRANT LABOR AS A FORM OF INTERMITTENT SOCIAL ORGANIZATION AND AS A CHANNEL OF GEOGRAPHICAL MOBILITY,
New York State School of Industrial and Labor Relations, Ithaca.
William H. Friedland, and Dorothy Nelkin. May 67, 78p*
Prepared in cooperation with Office of Manpower Policy, Evaluation, and Research, Department of Labor, Washington, D. C.

Descriptors: (*Geography, Manpower studies), (*Sociology, *Labor), Economics, Political science, Systems engineering, Ecology, Culture, Analysis, Money, Tables, Site selection, Topology, Organizations, Agriculture, Wages, New York, Employment.
Identifiers: Migrancy.

The research endeavor attempted to develop information about migrant labor in New York State, the character of the participants, the organization of crews, of work, and of labor camps, and about 'dropouts'--that is, the people who come north within the stream and then drop out to find employment in the north, even if only for a short period. Essentially seeking to consider some of the sociological aspects of seasonal interstate agricultural workers, the study also involved a variety of economic, political, and policy aspects of migrancy. (Author)
PB-177 867 HC$3.00 MF$0.65

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

A SUMMATION TECHNIC FOR SERUM TOTAL LIPIDS: A COMPARISON OF METHODS.
Rept. for Feb-Jul 67,
School of Aerospace Medicine Brooks AFB Tex
Chandler S. Cheek, and Dorothy F. Wease. Feb 68, 18p Rept no. SAM-TR-68-18

Descriptors: (*Blood serum, *Lipids), Cholesterol, Phospholipids, Optical analysis, Gravimetric analysis, Automation.
Identifiers: Triglycerides, Turbidometric analysis.

An efficient summation technic for the quantitation of total lipid from the results of the cholesterol, phospholipid, and triglyceride assays is compared to the phenol turbidity and gravimetric methods. In addition, two proposed methods for an automated, sequential, multiple, lipid analytic system are discussed and evaluated. (Author)
AD-669 345 HC$3.00 MF$0.65

THE EFFECTS OF STRESS HORMONE UPON THE CATABOLISM OF DERMAL COLLAGEN.
Children'S Hospital Washington D C Biochemical Research Lab
For primary bibliographic entry see Field 6P.
AD-669 555 Not available from CFSTI.

HEMOGLOBIN AND ITS REACTION WITH LIGANDS,
Rome Univ (Italy) Istituto Di Chimica Biologica
Eraldo Antonini. 1967, 11p
AFOSR-68-0922
Grant AF-EOAR-22-66
Availability: Published in Science, v158 n3807 p1417-25 Dec 15 1967.

Descriptors: (*Hemoglobin, Molecular association), Molecular structure, Dissociation, Complex compounds, Peptides, Thiols, Chemical indicators, Peptide hydrolases, Antigens + antibodies, Reaction kinetics, Oxygen, Carbon dioxide, Italy.

Described in this article are a few aspects of the reaction of hemoglobin with ligands, with particular emphasis on the interrelation between the function behavior and the structural properties of the protein. (Author)
AD-669 632 Not available from CFSTI.

FREE AMINO ACIDS IN THE SOIL.
Scripta Technica, Inc., Washington, D. C.
T. M. Ivashkevich, V. F. Kupprevich, and T. A. Shcherbakova. Feb 68, 5p NASA-TT-F-11498
Contract NASW-1694
Coll- 5 P Refs Tran- Transl. Into English From Dokl. Akad. Nauk Belorussk. Ssr, V. 6, No. 8, 1962 P 523-526

Descriptors: *Amino acids, *Soils, Biology, Hydrolysis, Metabolism, Minerals, Nitrogen, Organic chemistry, Plants (botany), Proteins.

For abstract, see STAR 06 12.
N68-22580 HC$3.00 MF$0.65

PURIFICATION OF COMPLEMENT COMPONENTS FROM HUMAN SERUM AND STANDARDIZATION OF REAGENTS USED IN THEIR ASSAY.
Contract progress rept. 20 Jun 67-1 Mar 68,
Cordis Corp., Miami, Fla.
S. P. Halbert. 1 Mar 68, 35p
Contract PH43-66-936

Descriptors: (*Complement, Purification), Separation, Chromatographic analysis, Blood serum, Chemical precipitation, PH, Freezing, Storage, Stability, Antigens + antibodies, Standardization, Guinea pigs, Humans.

The nine known components of human complement and C'1 inactivator were purified. The report gives procedures involving (a) precipitation at strength, pH 7.5 and 5.5, (b) salting out with high concentrations of ammonium sulfate, (c) DEAE- and CM-cellulose column chromatography, and (d) gel filtration with Sephadex. Improved purification procedures were aimed at increasing production, especially of C'6 and C'7. Both solubilization chromatography and hydroxylapatite separation were explored (for C'2, 6, 7, and C'3 from C'5). Guinea pig serum was processed in starting quantities of 25 to 500 ml. Most of the human and guinea pig components, with the exception of C'4 hu, are stable for several months at -70C in the presence of 1% gelatin. Human C'4, as harvested, is extremely labile to freezing and storage of this component at 0C in the presence of 1% gelatin results in no loss of activity over prolonged periods of storage. An attempt was made to standardize and characterize antibodies to sheep erythrocytes, to prepare stable cellular intermediates for component assay (EAC'1, EAC'1,4, EAC'4 and EAC'1-7), and to develop a C'4-7 package. (Author)
PB-178 047 HC$3.00 MF$0.65

EFFECT OF VITAMIN B12 AND CHOLINE ON THE STATE OF THE ANTICOAGULATING SYSTEM OF THE BLOOD OF THE HEALTHY IN CONDITIONS OF EXPERIMENTAL HYPERCHOLESTEREMIA,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
A. Sh. Byshevskii. 15 Mar 68, 4p NIH-3-7-68
Trans. of Vrachebnoe Delo (USSR) n4 p93-5 1965, by Z. Knowles.

Descriptors: (*Blood coagulation, *Vitamin B complex), (*Cholines, Blood coagulation), Anticoagulants, Inhibition, Cholesterol, Blood chemistry, Thrombosis, Fibrinogen, USSR.
Identifiers: Translations.

Experiments carried out in 66 male rats showed that two hours following administration of vitamin B12 and three hours following administration of choline and euglobulin lysis time increased and the fibrinolytic activity of the plasma became inhibited. With repeated administration of these substances the mentioned changes became marked. Vitamin B12 and choline administered at the background of a cholesterol and 6-methylthiouracil ration aggravated the abovementioned changes of the anticoagulating system of the blood. (Author)
PB-178 132T HC$3.00 MF$0.65

6B. Bioengineering

BIOMEDICAL APPLICATIONS TEAM QUARTERLY PROGRESS REPORT, 15 DEC. 1967 - 14 MAR. 1968.
Research Triangle Inst., Durham, N. C. Engineering and Environmental Sciences Div.
14 Mar 68, 104p NASA-CR-94295, QPR-3
Contract NSR-34-004-045

Descriptors: *Bioinstrumentation, *Clinical medicine, *Medical science, *Technology utilization, Aerospace sciences, Bibliographies, Communicating, Nasa programs, Technologies.

For abstract, see STAR 06 12.
N68-22026 HC$3.00 MF$0.65

EXPERIMENTAL ASSEMBLY AND STERILIZATION LABORATORY - CLOTHING STUDY.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. A. Botan. 15 Apr 67, 68p NASA-CR-94343, AVSSD-0138-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Circuit boards, *Clothing, *Contamination, *Microorganisms, *Printed circuits, Assembling, Bioassay, Electronic packaging, Quality control, Sterilization.

For abstract, see STAR 06 12.
N68-22412 HC$3.00 MF$0.65

EFFECTIVENESS OF UTILIZING ASSAY COUPONS FOR BIOLOGICAL LOAD PREDICTION.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. A. Botan. 15 Apr 67, 50p NASA-CR-94344, AVSSD-0150-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Bioassay, *Biological effects, *Contamination, *Laminar flow, Aerobes, Circuit boards, Mesophiles.

For abstract, see STAR 06 12.
N68-22757 HC$3.00 MF$0.65

AN ADAPTIVE APPROACH TO OPTIMUM SWITCHING CONTROL OF ARTIFICIAL ARMS.
California Univ., Los Angeles. Dept. of Engineering.
For primary bibliographic entry see Field 6E.
PB-177 824 HC$3.00 MF$0.65

6C. Biology

LIGHT-EMITTING MOLECULE IN A NEW PHOTOPROTEIN TYPE OF LUMINESCENCE SYSTEM FROM THE EUPHAUSID SHRIMP MEGANYCTIPHANES NORVEGICA,
Princeton Univ N J Dept of Biology
Osamu Shimomura, and Frank H. Johnson. 1967, 4p
Contract Nonr-4264 (00), Grant NSF-GB-4086
Availability: Published in Proceedings of the National Academy of Sciences, v59 n2 p475-7 Feb 1968.

Descriptors: (*Proteins, Luminescence), Crustacea, Molecular weight, Absorption spectrum, Photons, Fluorescence.
Identifiers: Photoproteins.

The data in the paper indicate that the light-emitter of the Meganyctiphanes system is either the fluorescent substance itself or some slightly and reversibly altered state of this substance. Thus the emission spectrum of fluorescence, excited at the excitation peak of 392 plus or minus 2 millimicrons, has a slightly broader distribution than the emission spectrum of the luminescence reaction but otherwise the two emission spectra are closely the same, with identical maxima at 476 millimicrons. The ultraviolet absorption spectrum was found to be in good agreement with the excitation spectrum. (Author)
AD-669 158 Not available from CFSTI.

SITUATIONAL CONDITIONED REFLEXES IN DOGS IN NORMAL AND PATHOLOGICAL STATES,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 5J.
AD-669 274 HC$3.00 MF$0.65

CORTICOSPINAL FIBERS IN NEW WORLD AND OLD WORLD SIMIANS,
Walter Reed Army Inst of Research Washington D C
J. M. Petras. 1968, 4p
Availability: Published in Brain Research, v8 p206-8 1968.

Descriptors: (*Central nervous system, *Monkeys), Cerebral cortex, Excision, Nerves, Muscles, Degradation, Nerve cells, Legs, Hands, Touch, Musculoskeletal system, Proprioception.
Identifiers: Corticospinal fibers, Motor cortical fibers.
AD-669 384 Not available from CFSTI.

THE EFFECT OF STAPHYLOCOCCAL ENTEROTOXIN ON THE FINE STRUCTURE OF THE MONKEY JEJUNUM,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6M.
AD-669 385 Not available from CFSTI.

INTESTINAL OBSTRUCTION AND DEATH IN SUCKLING RATS DUE TO SAWDUST BEDDING,
SEATO Medical Research Lab Bangkok (Thailand)
Paul C. Smith, Jack S. Stanton, Richard D. Buchanan, and Prayot Tanticharoenyos. 1968, 5p
Availability: Published in Laboratory Animal Care, v18 n2 p224-8 Apr 1968.

Descriptors: (*Laboratory animals, Intestines), (*Intestines, *Obstruction (Physiology)), Mortality rates, Diarrhea, Test methods, Culture media, Bacteria, Viability, Pathology, Biopsy, Predictions.
Identifiers: Sawdust.

A disease syndrome which produced a mortality rate of 42.9% in suckling rats and affected 94% of the litters born in a random bred production colony of albino rats during a 1 month period is described. The condition, which resembled an infectious process, was proved to be directly related to blockage of the ileo-cecal orifice by minute particles of sawdust bedding. (Author)
AD-669 391 Not available from CFSTI.

DOWN'S SYNDROME WITH G/G TRANSLOCATION AND TRIPLE-X SYNDROME IN THE SAME SIBSHIP,
Naval Medical Research Unit No 2 Taipei (Taiwan)
Shih-Wen Huang, and Irvin Emanuel. 1967, 8p Rept no. NAMRU-2-TR-304
Availability: Published in Acta Paediatrica Sinica, v8 n4 p195-7 Oct-Dec 1967.

Descriptors: (*Chromosomes, Anomalies), (*Anomalies, Taiwan), Genetics, Cytology, Medical research.
Identifiers: Down's syndrome, G/G translocation, Triple X syndrome, Case histories.

A family is reported in which one pregnancy ended in miscarriage, one child has G/G translocation Down's syndrome, one child has triple-X syndrome, and three children are normal. The parents are cytogenetically normal. (Author)
AD-669 405 Not available from CFSTI.

DRUG RESISTANCE OF ENTERIC BACTERIA. XII. UNIQUE SUBSTRATE SPECIFICITY OF PENICILLINASE PRODUCED BY R FACTOR,
Gunma Univ Maebashi (Japan) Dept of Microbiology
For primary bibliographic entry see Field 6M.
AD-669 406 Not available from CFSTI.

REPEATED OR CONTINUAL MEASUREMENTS OF CARDIAC OUTPUT IN THE SQUIRREL MONKEY (SAIMIRI SCIUREUS) BY THERMODILUTION,
Naval Aerospace Medical Inst Pensacola Fla
Hassan H. Khalil. 8 Mar 68, 23p Rept no. NAMI-1032

Descriptors: (*Cannulation, *Heart), (*Blood volume, Monkeys), Blood circulation, Temperature, Arteries, Thermocouples, Heating elements, Measurements, Electrocardiography, Respiration, Control systems, Models (Simulations), Thorax.
Identifiers: Thermodilution cardiac catheters, Heart rate.

A quantitative method suitable for measuring cardiac output in small animals is described. A modified version of a previously described catheter was designed and utilized in the present study. The chief modifications were dictated by the size of the animal, the type of temperature transducer used, and the diameter and length of the catheter. Based on thermodilution principles, cardiac output is directly proportional to the rate of heat introduced and inversely related to temperature rise. After reliable measurements were obtained using a circulation model, the catheter was evaluated in seven squirrel monkeys where reproducible results were obtained. The cardinal advantage of this method for rapid repeated measurements and the possibility of remote control are emphasized. (Author)
AD-669 450 HC$3.00 MF$0.65

REPRODUCTIVE PERIODICITIES OF MARINE ANIMALS OF TROPICAL MIDDLE EAST WATERS.
American Univ Cairo (Egypt)
For primary bibliographic entry see Field 8A.
AD-669 506 HC$3.00 MF$0.65

BIOCHEMICAL PROFILE OF NERVE MEMBRANE.
Chile Univ Santiago Laboratorio de Biofisica
For primary bibliographic entry see Field 6P.
AD-669 534 HC$3.00 MF$0.65

LABORATORY ANIMALS: THEIR CARE AND USE IN RESEARCH,
Army Natick Labs Mass Technical Library
Eugene G. Beary. Jan 68, 58p Rept no. Bibliographic-68-1

Descriptors: (*Laboratory animals, Bibliographies), Maintenance, Handling, Medical research, Scientific research, Indexes.

The checklist bibliography contains 484 references to the literature on the care and handling of laboratory animals and their use in research. The time coverage is 1950 to May 1967. The citations are arranged alphabetically by personal author. Subject and author indexes are included. (Author)
AD-669 617 HC$3.00 MF$0.65

ON THE EFFECT OF EXTERNAL CONDITIONS ON THE DEVELOPMENT OF FROG EGGS.
Techtran Corp., Glen Burnie, Md.
O. Hertwig. May 68, 7p NASA-TT-F-11676
Contract NASW-1695
Coll- 7 P Tran- Transl. Into English From the Book "uber Den Einfluss Ausserer Bedingungen Auf Die Entwickelung des Froscheies" Berlin, Sitzungbericht, Vol. 1, 1894 P 311-317

Descriptors: *Eggs, *Frogs, *Temperature effects, Brain damage, Growth, Physiological effects, Sodium chlorides.

For abstract, see STAR 06 12.
N68-22252 HC$3.00 MF$0.65

CONCERNING THE INFLUENCE OF POST-MATURITY OF OVA ON THE SEX RATIO OF FROGS AND BUTTERFLIES.
Uber Den Einfluss Der Uberreife Der Eier Auf Das Geschlechtsverhaltnis Von Froschen Und Schmetterlingen
Techtran Corp., Glen Burnie, Md.
R. Hertwig. May 68, 16p NASA-TT-F-11683
Contract NASW-1695
Coll- 16 P Refs Tran- Transl. Into English From Rept. on Sessions of the Mathematical Phys. Class of the Bavarian Acad. of Sci. (Munich), Jan. 1921 P 269-294

Descriptors: *Age factor, *Eggs, *Frogs, *Insects, *Sex, Females, Growth, Males.

For abstract, see STAR 06 12.
N68-22848 HC$3.00 MF$0.65

QUANTITATIVE CHARACTERISTICS OF ACTION POTENTIALS OF THE SOMA OF THE GIANT NEURONS OF THE MOLLUSK PHANORBIS CORNEUS DURING SPONTANEOUS PHYTHMIC DISCHARGE,
Federation of American Societies for Experimental Biology, Bethesda, Md.
For primary bibliographic entry see Field 6P.
PB-178 052T HC$3.00 MF$0.65

CONDITIONED REFLEXES IN THE BAIKAL PLANARIAN PODOPLANA OLIVACEA K. AFTER INJECTION OF RIBONUCLEASE,
Federation of American Societies for Experimental Biology, Bethesda Md.
For primary bibliographic entry see Field 6P.
PB-178 054T HC$3.00 MF$0.65

HEMPITERA, FLEAS, AND TICKS AS CARRIERS OF THE VIRUS OF EXANTHEMATOUS TYPHUS IN EXPERIMENTAL CONDITIONS,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
A. A. Klimentova, and P. P. Perfilev. 9 Feb 68, 16p NIH-2-16-68
Trans. of mono. Parasity, Perenoschiki i Yadovitye Zhivotnye, Moscow, p71ff 1935, tr. by Z. Knowles.

Descriptors: (*Rickettsia, *Disease vectors), Hemiptera, Siphonaptera, Ticks, Bites + stings, Viability, Virus diseases, Epidemiology, USSR.

Experimental exanthematous typhus was produced in guinea pig by inoculation of Hemiptera and of 2 species of ticks (Ornithodorus lahorensis and Argas persicus). The virus can be kept in ticks up to 25 days. The fact of the lengthening of the incubation period in guinea pigs at the feeding of Ornithodorus lahorensis on them may be interpreted as a weakening of the virus, depending on the length of the stay of the virus in the tick. The Ornithodorus lahorensis ticks proved capable of transmitting the virus to guinea pig via bite. The facts considered promote the question of a possible role of the tick in the spread of exanthematous tick among people. Transmission of the virus of exanthematous typhus to guinea pig was possible by introduction of Argas persicus ticks ground to a powder. The virus is preserved in the tick for up to 10 days. The question of the possibility of transmission via bite remains open. (Author)
PB-178 139T HC$3.00 MF$0.65

CUCUMBER POLLINATING ACTIVITY OF HONEY BEES IN GREENHOUSES.
National Agricultural Library, Beltsville, Md. Bee Culture Branch.
Jan 68, 4p
Trans. of Pchelovodstov (USSR) v37 n1 p28-31 1960.

Descriptors: (*Hymenoptera, Behavior), Ecology, Flight, Plants (Botany), Reproduction (Physiology), Pollen, Sensory perception, USSR.
Identifiers: Translations.

The observations showed that the decrease of bee flight to cucumber flowers during a strong nectar flow can easily be prevented by closing the windows for the bee flight to the outside in the evening and opening them only at about 10 o'clock in the morning. In such a case, the bees will fly into the greenhouse in the morning and effect a mobilization of the young bees to the cucumber flowers, but the activity of bees flying to the outside is curtailed at this time. Such a method was used in the course of three years and yielded positive results. It is useful to train bees by placing feeders with syrup brewed on cucumber flowers. (Author)
PB-178 151T HC$3.00 MF$0.65

NEW DATA ON THE REPRODUCTION OF POLAR BEARS,
National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.
E. Ya. Kostyan. 1968, 11p SFCSI-Int (TT-68-50386)
Trans. of Zoologicheskii Zhurnal (USSR) v33 n1 p207-15 1954.

Descriptors: (*Carnivora, Reproduction (Physiology)), Polar regions, Ecology, Nutrition, Birth, Pregnancy, Infants, Adaptation (Physiology), USSR.
TT-68-50386 HC$3.00 MF$0.65

6D. Bionics

SOVIET CYBERNETICS TECHNOLOGY: XI. HOMOGENEOUS, GENERAL-PURPOSE, HIGH-PRODUCTIVITY COMPUTER SYSTEMS--A REVIEW,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 9B.
AD-669 321 HC$3.00 MF$0.65

HAND-PRINTED INPUT FOR ON-LINE SYSTEMS.
System Development Corp Santa Monica Calif
For primary bibliographic entry see Field 9B.
AD-669 368 HC$3.00 MF$0.65

SELECTION OF AVERAGED STANDARD PICTURES,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9B.
AD-669 424 HC$3.00 MF$0.65

MODELS OF NEUROELECTRIC INTERACTIONS.
Final rept. Apr 65-Jul 67,
General Precision Inc Glendale Calif Librascope Group
Edwin R. Lewis. Dec 67, 152p
AMRL-TR-67-132
Contract AF 33 (615)-2464

Descriptors: (*Nervous system, *Bionics), Nerve cells, Electrophysiology, Nerve impulses, Ganglia, Models (Simulations), Analog systems, Circuits, Electrolytes (Physiology), Inhibition, Crustacea, Electrical conductance, Interactions.

The Hodgkin-Huxley descriptions of electrically excitable conductances are combined with Eccles descriptions of synaptic conductances to provide the basis of an electronic analog of nerve cell membrane. A neural simulation facility is constructed, comprising ten pairs of these analogs with associated input and output equipment. A detailed description of the simulation facility is presented, including design philosophy, circuit, system and mechanical details. The simulation facility is used to model spatially distributed neuroelectric phenomena. Significant results include resetting of potentials in integrative regions by spikes generated at a remote site, stable spike synchrony in independently driven, mutually inhibiting distributed neural models, burst formation in mutually exciting neural models, and various nonuniformities of wave shape and velocity in conduction along a distributed axon. In addition, the facility is used in a simulation study of the lobster cardiac ganglion. As results of this study, mechanisms are proposed for ganglion operation and specific neuronal connectivities are predicted. (Author)
AD-669 574 HC$3.00 MF$0.65

FREQUENCY CODED THRESHOLD LOGIC UNIT FOR PATTERN RECOGNITION APPLICATION.
Rensselaer Polytechnic Inst., Troy, N. Y.
D. Hinks, and R. Roy. May 68, 72p NASA-CR-1035
Contract NGR-33-018-014
Coll- 72 P Refs

Descriptors: *Central nervous system, *Logical elements, *Pattern recognition, *Signal encoding, Digital techniques, Equipment specifications, Logic design, Pulse frequency modulation.

For abstract, see STAR 06 12.
N68-22448 HC$3.00 MF$0.65

6E. Clinical Medicine

MANUAL FOR PREPARATION OF A POROUS PTB SOCKET WITH SOFT DISTAL END.
Technical rept.,
Walter Reed Army Medical Center Washington D C Army Medical Biomechanical Research Lab
James T. Hill, Henry Mouhot, and Robert E. Plumb. May 68, 22p Rept no. TR-6804

Descriptors: (*Prosthetics, Joints (Physiology)), Preparation, Instruction manuals, Artificial limbs, Porosity, Laminated plastics.

A simplified procedure for preparing PTB sockets is described. Preimpregnation of the stockinet and evaporation of solvent prior to layup results in a stronger, more porous socket. (Author)
AD-669 238 HC$3.00 MF$0.65

CLINICAL, LABORATORY AND FIELD STUDIES ON DRUG RESISTANCE OF PLASMODIUM FALCIPARUM.
Instituto Brasileiro de Tropicologia Medica Rio de Janeiro
For primary bibliographic entry see Field 6O.
AD-669 249 HC$3.00 MF$0.65

A DEVICE FOR MASS EKG EXAMINATION OF THE POPULATION (USTROISTVO DLYA MASSOVOGO ELEKTROKARDIOGRAFICHESKOOBSLEDOVANIYA NASELENIYA),
Foreign Technology Div Wright-Patterson AFB Ohio
M. B. Tartakovskii, I. D. Pupko, and V. K. Dolgov. 19 Jul 67, 9p Rept no. FTD-HT-23-881-67
Unedited rough draft trans. of Patent (USSR) 188 621, 20 Jan 64 2p, by F. Dion.

Descriptors: (*Electrocardiography, Analysis), Electrodes, Electronic equipment, Automata, Correlation techniques, Commutators, Population, Pulse rate.
Identifiers: Comparison circuits, Storage circuits, Signal indicators, Electrocardiography elements.

In contrast to the known devices, the proposed device contains a block for analyzing the time relationships of the EKG elements, a block for analyzing the amplitude relationships of the EKG elements, a block for indicating the results of the examination and an automatic electromechanical lead commutator. Such a device allows automatic evaluation of the EKG elements of the patients relative to a normal EKG and production of a signal about deviations of one of the selected EKG elements. (Author)
AD-669 267 HC$3.00 MF$0.65

ARON ALPHA A 'SANKYO,' JAPANESE TISSUE ADHESIVE, IN SURGERY OF INTERNAL ORGANS,
Walter Reed Army Inst of Research Washington D C
Teruo Matsumoto, Robert M. Hardaway, III, K. C. Pani, and Peter M. Margetis. Apr 68, 5p
Availability: Published in The American Surgeon, v34 n4 p263-7 1968.

Descriptors: (*Surgical supplies, Adhesives), Tissues (Biology), Surgical techniques, Acrylic resins, Toxicity, In vivo analysis.
Identifiers: Cyano acrylates, *Tissue adhesives.

Aron alpha A 'Sankyo' was evaluated in the surgery of internal organs by comparison with n-butyl and ethyl cyanoacrylate monomers. Aron alpha A is similar to ethyl cyanoacrylate monomer, which disappeared from the tissue faster but is almost as histotoxic as methyl cyanoacrylate monomer compared to the higher homologous monomers. (Author)
AD-669 383 Not available from CFSTI.

THE EFFECT OF STAPHYLOCOCCAL ENTEROTOXIN ON THE FINE STRUCTURE OF THE MONKEY JEJUNUM,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6M.
AD-669 385 Not available from CFSTI.

MEDIASTINAL GANGLIONEUROMAS IN CHILDREN, REPORT OF A CASE: BILATERAL THORACIC BENIGN GANGLIONEUROMAS,
Army Tripler General Hospital Honolulu Hawaii
Walter L. Scheetz, and Lee S. Serfas. 1968, 5p
Availability: Published in Military Medicine, v133 n3 p226-30 Mar 1968.

Descriptors: (*Neoplasms, Ganglia), Diagnosis, Radiography, Pathology, Therapy, Amines, Excretion, Children.

The clinical manifestations, roentgenologic diagnosis and treatment of mediastinal ganglioneuromas are reviewed. A patient with bilateral simultaneously occurring thoracic ganglioneuromas is presented. The absence of reliable clinical criteria and the need for histologic diagnosis to rule out malignancy is stressed. The avoidance of life-threatening or disability-producing attempts at complete removal of benign ganglioneuromas is recommended since follow-up studies suggest that these tumors rarely recur or cause symptoms. The so-called 'maturation' phenomenon may be only an example of the varied histologic pattern within a tumor and the pleuripotentiality of neural crest cells. Host susceptibility and resistance may play a role. The use of urinary catecholamines and vanilmandelic acid values as an aid in biochemically classifying the tumors as well as in diagnosis and follow-up is discussed. (Author)
AD-669 392 Not available from CFSTI.

SERUM COMPLEMENT AND THE ENZYMATIC DEGRADATION OF ERYTHROCYTE PHOSPHOLIPID,
Walter Reed Army Inst of Research Washington D C
J. Kelly Smith, and Elmer L. Becker. 1968, 17p
Availability: Published in Journal of Immunology, v100 n3 p459-74 1968.

Descriptors: (*Phospholipids, Degradation), (*Erythrocytes, Hemolysis), Complement, Serum albumin, Immune serums, Preparation, Lipids, Antigens + antibodies, Enzymes, Membranes (Biology).

Small but significant and reproducible alterations in the phospholipid and titratable acid contents of reaction mixtures containing sensitized sheep erythrocytes and guinea pig serum occurred during and following the process of lysis. In experiments employing erythrocytes sensitized with anti-Forssman antibody, there was a fall in the total serine phosphatide content of the mixtures. In experiments using cells sensitized with hyperimmune antibody there was a fall in the total choline phosphatide content of the mixtures. In so far as studied, the lipid alterations had the characteristics of an enzyme reaction which is dependent for its activation on the presence of both sensitized erythrocytes and guinea pig serum, and which was influenced in terms of its substrate by the nature of the sensitizing antibody. Although the exact nature of the enzymatic process is unclear, the results suggest that the titratable acid changes are related to the action of C'8 or C'9 and are not the result of nonspecific activation of membrane, or of intracellular or serum enzymes following hemolysis of erythrocytes. Whereas it is likely that the lipid changes seen in these experiments are related to

the action of serum complement, certain other data in this work indicate that the nature of this relationship is not clear. (Author)
AD-669 394 Not available from CFSTI.

SPLENIC FUNCTION IN EXPERIMENTAL MALARIA,
Walter Reed Army Inst of Research Washington D C
Marcel E. Conrad, and Lewis H. Dennis. 1968, 3p
Availability: Published in The American Journal of Tropical Medicine and Hygiene, v17 n2 p170-2 1968.

Descriptors: (*Parasitic diseases, Blood analysis), (*Spleen, Blood cells), Plasmodium, Monkeys, Blood transfusions, Labeled substances, Erythrocytes, Chromium compounds, Parasites, Removal.
Identifiers: Splenectomy.

Normal and splenectomized rhesus monkeys were transfused with chromium-labeled erythrocytes from monkeys severely infected with Plasmodium knowlesi. Radiochromium disappeared from the blood of both normal and splenectomized recipient animals at a rapid and similar rate. Parasites disappeared from the blood of normal but not splenectomized monkeys faster than did the radiochromium. This suggested that the spleen removed malaria parasites from transfused cells without destroying the erythrocytes that contained them. (Author)
AD-669 395 Not available from CFSTI.

TEMPERATURE TAKING TIMES IN VIETNAM,
Walter Reed Army Inst of Research Washington D C
Glennadee A. Nichols, and Beverly A. K. Glor. Feb 68, 6p
Availability: Published in Military Medicine, v133 n2 p154-8 1968.

Descriptors: (*Military medicine, *Body temperature), Physiology, Military personnel, Medical personnel, Thermometers, Test methods, Nurses, Vietnam.
Identifiers: South Vietnam.

This research in nursing assessed the time required for thermometers to register body temperatures in Vietnam and made comparisons of oral, axillary, and rectal readings. (Author)
AD-669 402 Not available from CFSTI.

VIRUSES RECOVERED FROM LABORATORY DOGS WITH RESPIRATORY DISEASE,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6M.
AD-669 403 Not available from CFSTI.

STUDIES OF IMMUNE MECHANISMS IN LEPROSY. I. DEPRESSION OF DELAYED ALLERGIC RESPONSE TO SKIN TEST ANTIGENS.
Technical rept.,
Naval Medical Research Unit No 2 Taipei (Taiwan)
Ward E. Bullock. 8 Feb 68, 11p Rept no. NAMRU-2-TR-306
Availability: Published in New England Journal of Medicine, v278 p298-304 Feb 8 1968.

Descriptors: (*Mycobacterium leprae, Immunity), Antigen-antibody reactions, Allergy, Skin, Tests, Diagnosis, Responses, Tuberculin, Sensitivity, Infectious diseases, Chemotherapeutic agents, Convalescence, Pathology, Taiwan.
Identifiers: *Skin tests, Diamino diphenyl sulfone.

Skin tests of delayed hypersensitivity performed on 107 patients with leprosy and 30 controls with six protein antigens and the hapten, picryl chloride, indicated that leprosy is associated with a generalized depression of the delayed allergic inflammatory response. The depression is of greatest severity in patients with lepromatous leprosy and is less among tuberculoid patients. Patients were assigned to groups according to time under therapy with diaminodiphenylsulfone, and the results of skin tests were compared. There was a significant progression toward 'normal' reactivity to skin-test antigens in 'long-term' as compared with 'short-term' treatment groups. This trend was more evident among lepromatous patients; the possible salutary effects of chemotherapy upon skin reactivity were defined less sharply in tuberculoid patients. Attempts to establish primary sensitization to picryl chloride failed in a high percentage of patients with leprosy as compared with controls, regardless of type of disease or stage of convalescence. Factors directly related to the pathologic process itself appear to act, at least in part, as determinants of immunologic reactivity in leprosy. (Author)
AD-669 477 Not available from CFSTI.

TRADITIONAL MEDICINE IN MODERN CHINA: SCIENCE, NATIONALISM, AND THE TENSIONS OF CULTURAL CHANGE.
Harvard East Asian Series,
Harvard Univ Cambridge Mass East Asian Research Center
Ralph C. Croizier. 1968, 341p Rept no. Ser-34
AFOSR-68-0992
Contract AF 49 (638)-1399
Availability: Hard copy available from Harvard University Press, Cambridge, Mass. $6.00.

Descriptors: (*Medicine, China), History, Culture, Communism, Pharmacology, Public health, Medical personnel, Government (Foreign), Theory, Social sciences.

The book is a by-product of a major project supported under this contract entitled: 'Military Implications of Change - Communist China'. In this book the author describes the traditional Chinese medical system; traces the spread of modern medicine in China and its effects on the theories and practice of Chinese medicine; and discusses the socio-political implications of the issue in Communist China. The Chinese struggle over adoption of modern medicine is shown to reflect those tensions engendered by the often conflicting claims of cultural nationalism and reverence for modern science. (Author)
AD-669 505 Not available from CFSTI.

IMMEDIATE POSTSURGICAL FITTING AND EARLY AMBULATION: A NEW CONCEPT IN AMPUTEE REHABILITATION,
Navy Prosthetic Research Lab Oakland Calif
F. L. Golbranson, Charles Asbelle, and Donald Strand. 1968, 14p
Availability: Published in Clinical Orthopaedics, n56 p119-31 Jan-Feb 1968.

Descriptors: (*Amputees, Rehabilitation), Amputation stumps, Dressings, Prosthetics, Therapy, Cardiovascular diseases, Wounds + injuries, Healing, Surgical techniques.

The immediate postsurgical fitting program consists of several distinct segments: The rigid dressing; Immediate and early ambulation; Prosthetics; Gait training and physical conditioning; Patients with vascular disease.
AD-669 538 Not available from CFSTI.

CO2 LASER INDUCED SKIN LESIONS.
Final rept.,
Army Medical Research Lab Fort Knox Ky
Arnold S. Brownell, Wordie H. Parr, David K. Hysell, and Robert S. Dedrick. 13 Mar 68, 25p Rept no. USAMRL-769

Descriptors: (*Lasers, *Burns), Radiation injuries, Pathology, Skin, Exposure, Dosage, Carbon dioxide, Mathematical models, Tables.

Depilated skin of white pigs was exposed to different exposure time-irradiance combinations using CO2 laser radiation (10.6 microns). The lesions produced ranged from a mild erythema to partial tissue coagulation. The probability of producing a particular grade of lesion was then established for power densities within the range of 0.69-13.6 watts/sq. cm and exposure times of 0.2 to 40 sec. Data obtained are adequate to establish laser safety standards. A relatively simple model is discussed that describes the exposure parameters to produce threshold skin lesions. (Author)
AD-669 610 HC$3.00 MF$0.65

ROLE OF SINO-AORTIC REFLEXES IN THE REGULATION OF EXPERIMENTAL RENAL HYPERTENSION DURING NATURAL SLEEP,
Milan Univ (Italy) Istituto Di Patologia Medica
For primary bibliographic entry see Field 6P.
AD-669 636 Not available from CFSTI.

FROSTBITE. THE PROBLEMS OF MANAGEMENT AND A REVIEW OF 200 CASES,
Mills (William J) Jr Anchorage Alaska
William J. Mills, Jr. 15 Feb 68, 54p*
Contract Nonr-3183 (00)

Descriptors: (*Frostbite, Therapy), Pathology, Freezing, Tissues (Biology), Necrosis, Extremities, Surgery, Infections, Wounds + injuries, Pain, Skin, Transplantation, Hypothermia, Dehydration, Biopsy, X rays, Reviews.
Identifiers: Thawing, Case histories.

Two hundred cases of frostbite were treated according to a standard hospital routine consisting of open, sterile care, whirlpool bath, intensive active physiotherapy, and postponement of surgical intervention. Twenty-one patients, or 10.5%, lost phalanges or portions of phalanges. There was one major amputation. Seventy additional cases with frostbitten extremities received other forms of treatment. Of these, thirty-five, or 50%, lost tissue. Thirteen patients, or 18.57%, had major amputations. Of the cases treated, forty-eight were seen prior to thawing and were rewarmed in water at above body temperature. Two extremities lost a digit and one the tuft of the distal phalanx. Although the number of cases is insufficient to permit positive conclusions, the clinical results following rapid thawing appear to be superior to those following other means of thawing. (Author)
AD-669 692 HC$3.00 MF$0.65

THE EVACUATION OF INJURED IN LARGE-SCALE NATURAL AND OTHER DISASTERS,
Joint Publications Research Service, Washington, D. C.
Marijan Bervar, and Mihailo Funtek. 25 Jan 68, 11p
Trans. of Vojnosanitetski Pregled (Yugoslavia) n11 p594-7 1967.

Descriptors: (*Disasters, Evacuation), Classification, Transportation, Organizations, Safety, Wounds + injuries, Decision making, Posture, Yugoslavia.
Identifiers: Emergency relief measures.

Contents: Organization of evacuation at the site of the disaster; The tasks of medical evacuation; Evacuation classification; Preparing the injured for evacuation; Position during evacuation; Therapeutic procedures during evacuation; Transport vehicles for evacuating injured; Improvised means of evacuation.
JPRS-44147 HC$3.00 MF$0.65

FIFTY YEARS OF SOVIET HEMATOLOGY,
Joint Publications Research Service, Washington, D. C.
I. A. Kassirskii. 8 Feb 68, 12p
Trans. of Terapevticheskii Arkhiv (USSR) n11 p15-21 1967.

Descriptors: (*Hematology, Reviews), Medical research, Blood diseases, Blood transfusions, Biopsy, Diagnosis, Anemias, Etiology, Leukemia, USSR.
JPRS-44293 HC$3.00 MF$0.65

DEVELOPMENT OF METHODS OF X-RAY DIAGNOSIS OF DISEASES OF THE HEART AND VESSELS IN THE USSR,
Joint Publications Research Service, Washington, D. C.
P. N. Mazaev. 9 Feb 68, 11p
Trans. of Vestnik Rentgenologii i Radiologii (USSR) v42 n6 p3-8 1967.

Descriptors: (*Cardiovascular diseases, Radiography), X rays, Diagnosis, Pathology, USSR.
JPRS-44312 HC$3.00 MF$0.65

ELECTROMYOGRAPHIC RESEARCH ON SPEECH SOUNDS,
Joint Publications Research Service, Washington, D. C.
R. S. Dadashev, and E. V. Shtilman. 12 Feb 68, 20p
Trans. of Kibernetika (USSR) 1967 p230-52.

Descriptors: (*Electromyography, *Speech), Sound signals, Sources, Speech recognition, Speech representation, Analysis, Audiofrequency, Auditory signals, Thresholds (Physiology), Muscles, Spectrum signatures, USSR.
Identifiers: Articulation.

Speech, which is a complex function of many systems of the organism controlled by the central nervous system of man, constitutes a sequence of sounds (phonemes), whose combinations form various sound-compounds (syllables, words). The respiratory system and the vocal apparatus participate in the mechanism of speech production. The air leaving the lungs is interrupted by periodic vibrations of the vocal cords, which generate a specific frequency. This signal, passing through a system of resonators assuming a particular position, is transformed into a compound oscillation, which has a definite spectral pattern for every speech sound. Thus, the frequency spectrum of the sound depends on the relative position (or articulation) of the organs of the vocal apparatus which take part in the formation of that sound. (Author)
JPRS-44331 HC$3.00 MF$0.65

UKRAINIAN EPIDEMIOLOGIST L. V. GROMASCHEVSKII HONORED,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 5I.
JPRS-44706 HC$3.00 MF$0.65

SOVIET ADVANCES IN PLASTIC AND THORACIC SURGERY,
Joint Publications Research Service, Washington, D. C.
G. M. Solovev, O. A. Dolina, and Yu. N. Zhilin. 14 Mar 68, 19p
Trans. of Grudnaya Khirurgiya (USSR) n6 p3-9, 24-7 Nov/Dec 1967.

Descriptors: (*Plastic surgery, USSR), Heart, Blood vessels, Thorax, Surgery, Anesthesia, Cardiovascular system.

Contents: Surgical aspects of reconstructive operations on the heart and blood vessels; Progress in the use of anesthesia in chest surgery and prospects for the future.
JPRS-44707 HC$3.00 MF$0.65

BULGARIAN PSYCHIATRIC SERVICES,
Joint Publications Research Service, Washington, D. C.
G. Uzunov. 21 Mar 68, 19p
Trans. of Nevrologiya, Psikhiatriya i Nevrokhirurgiya (Bulgaria) p381-93 Oct 1967.

Descriptors: (*Public health, *Psychiatry), Hospitals, Mental disorders, Therapy, Medical personnel, Rehabilitation, Bulgaria.

JPRS-44754 HC$3.00 MF$0.65

THE DEVELOPMENT OF THE PUBLIC HEALTH SYSTEM IN THE USSR,
Joint Publications Research Service, Washington, D. C.
S. M. Bagdasaryan. 21 Mar 68, 43p
Trans. of mono. Razvitie Zdravookhraneniya v SSSR, Moscow, 1967 p1-32.

Descriptors: (*Public health, USSR), History, Therapy, Hospitals, Costs, Medical personnel, Hygiene, Pregnancy, Birth, Children, Medicine, Training, Medical research, Epidemiology, Microbiology, Industrial medicine.

Contents: Public health on the eve of the great October socialist revolution; Inauguration and development of Soviet socialist public health system; Therapeutic and preventive medical assistance to the community; Problems of safeguarding mothers and children; Medical personnel training system; Development of medical science and industry.
JPRS-44775 HC$3.00 MF$0.65

VACCINATION AGAINST TRACHOMA,
Joint Publications Research Service, Washington, D. C.
Giuseppe Penso. 22 Mar 68, 9p
Trans. of Voprosy Virusologii (USSR) n6 p735-9 1967.

Descriptors: (*Chlamydia trachomatis, *Vaccines), Immunity, Preparation, Infectious diseases, Experimental design, Antigens + antibodies, Public health, Epidemiology, USSR.

The results of the studies indicate that the use of vaccine can affect the incidence of trachoma as well as mitigate the course of the disease. The vaccine inhibits or prevents the growth of elementary bodies of the causative agent of trachoma in the conjunctival cells. It is assumed that starting from the time when the old epithelial cells are replaced by new ones as a result of metabolism, the newly formed cells keep receiving antibodies in sufficient quantity to prevent infection for a long time. The spread of the disease can be halted if 70 to 80% of the population is immunized. Since it is unlikely that trachoma can be eradicated solely by chemotherapy of antibiotics due to economic factors as well as to the presence of strains of the causative agent resistant to antibiotics or drugs, the only thing feasible, in addition to improving the sanitary conditions, is to carry out mass vaccinations. (Author)
JPRS-44779 HC$3.00 MF$0.65

POVERTY AND HEALTH IN THE UNITED STATES. A BIBLIOGRAPHY WITH ABSTRACTS.
Medical and Health Research Association of New York City, N. Y.
For primary bibliographic entry see Field 5B.
PB-177 655 HC$3.00 MF$0.65

ACCIDENT AND VIOLATION PATTERNS OF DRIVERS WITH CHRONIC MEDICAL CONDITIONS,
California State Dept. of Public Health. Bureau of Occupational Health.
For primary bibliographic entry see Field 13L.
PB-177 666 HC$3.00 MF$0.65

AN ADAPTIVE APPROACH TO OPTIMUM SWITCHING CONTROL OF ARTIFICIAL ARMS.
Biotechnology Lab. technical rept.,
California Univ., Los Angeles. Dept. of Engineering.
Amos Freedy, Luigi F. Lucaccini, and John Lyman. Aug 67, 22p TR-43, 67-47
Contract V1005p-9779

Descriptors: (*Artificial limbs, Control systems), Switching circuits, Adaptive control systems, Stability, Analog computers, Simulation, Optimization, Flow charting, Performance (Engineering).
Identifiers: Bang-bang control, Bioengineering.

The problems involved in adapting a 'bang-bang' switching system for control of an externally-powered artifical arm are considered. Stability problems of the 'bang-bang' system were solved by designing and constructing an adaptive self-stabilizing subsystem. The overall system was simulated on an analog computer for control of one-dimensional movements. In a pilot study four subjects using manual control demonstrated that the system would reach stable operation. (Author)
PB-177 824 HC$3.00 MF$0.65

FACTORS RELATED TO SURVIVAL OF BONE MARROW, SKIN AND OTHER ORGAN ALLOGRAFTS IN RATS.
Annual contract progress rept. 1 Sep 67-15 Feb 68,
Johns Hopkins Univ., Baltimore, Md. School of Medicine.
George W. Santos, and Albert H. Owens, Jr. 15 Feb 68, 16p
Contract PH43-66-924

Descriptors: (*Transplantation, *Immunology), (*Bone marrow, Transplantation), Immune serums, Electrophoresis, Gamma globulin, Antigens + antibodies, Toxicity, Responses, Toxic tolerances, Skin, Tables.
Identifiers: Immunosuppressive agents, Cyclophosphamides.

Antisera was prepared in the BN and LBNF sub 1 rat strains by immunization with suspensions of Proteus mirabilis coated with ACI antibody. The resulting sera gave a precipitation in gel of identity with the ACI and F344 sera, but negative results with Lewis, WF, Buf, BN and LBNF sub 1 strains. Immunoelectrophoresis and analysis of sera from ACI X Lewis F 1 and F 2 generations revealed this detected component to be an immunoglobulin with expected dominant genetic inheritance. The 51Cr release method for measuring cytotoxic antibody was adopted to the rat. The 30 possible cytotoxic antisera antibody was adopted to the rat. The 30 possible cytotoxic antisera produced by specific inter-strain immunization were tested against lymphocytes from each of the 6 rat strains. Lewis rats were given a lethal dose of busulfan together with various doses of cyclophosphamide. Remarkably low doses of cyclophosphamide added to busulfan were able to permit protection from lethality with allogeneic marrow. Animals given busulfan alone could not be protected from lethality with allogeneic marrow. Lewis animals injected with BN spleen cells 1 to 2 days prior to receiving cyclophosphamide and the subsequent transfer of BN spleen cells 24 hours after drug showed an increased severity of graft versus host disease as compared to animals who did not receive donor type cells prior to cyclophosphamide. (Author)
PB-178 048 HC$3.00 MF$0.65

PREPARATION OF HUMAN TRANSPLANTATION ANTIGENS.
Contract progress rept. 1 Sep 67-15 Feb 68,
New York Univ., N. Y. Medical Center.
Felix T. Rapaport. 15 Feb 68, 12p
Contract PH43-65-638

Descriptors: (*Transplantation, *Immunology), Leukocytes, Antigens + antibodies, Freezing, Storage, Skin, Erythrocytes, ABO incompatibility, Allergy, Blood groups.

Studies of particulate components of human blood leucocytes as transplantation antigens in man: Cytoplasmic extracts of human blood leucocytes isolated by mechanical disruption and differential centrifugation have the capacity to induce strong allograft sensitivity when injected into recipients immediately after preparation. Freezing and long-term storage of such antigens at -20C abrogates the ability of such preparations to cause accelerated or white graft rejection of donor skin grafts.

Rather, the recipients may exhibit relative prolongations in the survival of skin allografts obtained from the antigen donors. Mean test graft survival times of 15.0 days have been observed in subjects pretreated with 25 to 500 TTA units, when such stored antigens were prepared in a citrate-free medium. This result compares favorably with the mean survival time of 11.57 days observed in skin grafts exchanged between 45 pairs of untreated ABO compatible individuals. Role of erythrocyte group antigens in human transplantation: Erythrocyte group antigens A and B were found to be active as potent and group-specific transplantation antigens in man. ABO group-incompatible recipients pretreated with such antigens have rejected skin allografts obtained from donors incompatible for the same antigens in an accelerated (4-5 days) or white graft manner. Skin grafts applied to the same recipients from ABO compatible donors were accorded first-set survival times. Water-soluble and heat-stable antigens isolated from hog (A substance) and horse (B substance) stomachs were as active as erythrocytes in the induction of this type of allograft sensitivity. The latter observation broadens the spectrum of heterologous antigens capable of inducing allograft sensitivity in the mammalian host, and provides a readily available source of antigens for further studies of allograft rejection mechanisms in man. (Author)
PB-178 049 HC$3.00 MF$0.65

THE FLEXICON: AN APPROACH TO A LOW COST MEDICAL DISPLAY FOR COMPUTER PROCESSED DATA.
Technical memo,
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
L. G. Knowles, and W. A. Yates. Feb 68, 37p*
APL-TG-974
Contract NOw-62-0604

Descriptors: (*Radioactive isotopes, Scanning), (*Medical equipment, Data processing systems), Cathode ray tubes, Pictures, Diagnosis, Pathology, Delay lines, Systems engineering, Flow charting, Costs, Analog-to-digital converters.
Identifiers: Flexicon.

Computer processing of radioisotope scanning data, along with many other computer applications, implies the ability to display the results in a pictorial form. This paper discusses an inexpensive, general-purpose CRT display designed as the output device in a radioisotope scanning research system. The FLEXICON incorporates a 240,000-bit, 20,000-micron sec-long recirculating magnetostrictive delay line memory that refreshes the 160 x 250 matrix of picture elements 50 times per second. A six-bit word for each picture element is stored in six delay lines operating in parallel. At the end of the line, each six-bit word is retimed and fed back for recirculation, in addition to being converted to video with up to 64 levels of intensity. An additional delay line provides the timing signals. An X-Y cursor and command function console allows the observer to communicate back to the controlling computer. (Author)
PB-178 065 HC$3.00 MF$0.65

SELECTED REFERENCES ON ANTILYMPHOCYTE SERA.
National Inst. of Allergy and Infectious Diseases, Bethesda, Md.
Feb 68, 34p*

Descriptors: (*Lymphocytes, *Immune serums), (*Immunology, Bibliographies), (*Transplantation, Immunology), Kidneys, Liver, Leukocytes, Pathology, Tolerances (Physiology), Immunity, Bone marrow, Antigen-antibody reactions, Radiation effects, Gamma globulin, Allergy, Pharmacology.
Identifiers: Immunosuppressive agents.

The document contains 141 references on antilymphocyte sera. These primarily relate to kidney, liver, and other transplantation, but some relate to other aspects of antilymphocyte sera. The references were compiled from manual and computer bibliographic searches that were made through the NIH Library. A MEDLARS search produced 114 citations covering January 1964 through November 1967, or 47 months. A manual search resulted in an additional 27 citations covering the period 1950 through 1967. Three indexes are included: author, journal, and year. (Author)
PB-178 118 HC$3.00 MF$0.65

STUDY OF THE ETIOLOGY OF HUMAN LEUKEMIA IN EXPERIMENTS ON PRIMATES (PART II),
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
B. A. Lapin, L. A. Yakovleva, G. I. Deichman, M. I. Kuksova, and Yu. S. Krivoshein. 2 Feb 68, 29p NIH-2-25-68
Trans. of mono. Meditsinskaya Primatologiya, Tiflis, 1967 p167-83, by P. DePorte.

Descriptors: (*Leukemia, Etiology), Viruses, Primates, Electron microscopy, Blood transfusions, Humans, Agglutinins, Blood serum, Pathology, Hemorrhage, Hemopoietic system, USSR.
Identifiers: Translations.

The investigation showed that the blood of persons with various forms of leukemia contains a filterable agent (or agents) that is pathogenic for monkeys of various species. (Author)
PB-178 135T HC$3.00 MF$0.65

ISOLATED MYCOSIS OF THE BRAIN,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
V. P. Gryaznova. 20 Mar 68, 6p NIH-3-8-68
Trans. of Voprosy Neirokhirurgii (USSR) v29 n3 p58-9 1965, by P. DePorte.

Descriptors: (*Nervous system diseases, *Fungi), Diagnosis, Histology, Morphology (Biology), Brain, Necrosis, Pathology, USSR.
Identifiers: Translations.
PB-178 137T HC$3.00 MF$0.65

COMPLEX THERAPY (WORK AND PHARMACOLOGICAL) OF SCHIZOPHRENIC PATIENTS IN THE CONDITIONS OF THERAPY WORKSHOPS OF PSYCHONEUROLOGICAL DISPENSARIES - A WORK ON METHOD,
National Institutes of Health, Bethesda, Md. Translation Unit, Library.
T. Ya. Khvilivitskii, B. B. Malakhov, R. S. Rubinov, and L. R. Kaplan. 29 Mar 68, 27p NIH-3-15-68
Trans. of mono. Kompleksnaya Trudovaya i Farmakologicheskaya Terapiya Bolnykh Shizofrenyei v Usloviyakh Lechebno-Trudovykh Masterskikh Psikhonevrologicheskikh Dispanserov - Metodichekoe Pismo, Leningrad, 1967 24p, by Z. Knowles.

Descriptors: (*Psychoses, Therapy), Psychotropic agents, Psychiatry, Rehabilitation, Hospitals, Neuroses, USSR.
Identifiers: Translations, Schizophrenia.
PB-178 140T HC$3.00 MF$0.65

6F. Environmental Biology

A LONGITUDINAL ANALYSIS OF THE REFRACTIVE CHARACTERISTICS OF CHIMPANZEES.
Aeromedical Research Lab. (6571st), Holloman AFB, N. Mex.
For primary bibliographic entry see Field 6O.
AD-459 570 HC$3.00

QUESTIONS OF THE REPRODUCTION AND DISINFECTION OF VARIOUS MICROORGANISMS.
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 6M.
JPRS-44639 HC$3.00 MF$0.65

EFFECTS OF SPACE CABIN ENVIRONMENTS ON INFECTION FINAL REPORT, 19 JUL. 1965 - 18 SEP. 1966.
IIT Research Inst., Chicago, Ill. Technology Center.
R. Ehrlich, and B. J. Mieszkuc. Oct 66, 39p
NASA-CR-62065, IITRI-L6031-14
Contract NAS9-4978

Descriptors: *Infectious diseases, *Mice, *Pathological effects, *Radiation effects, *Spacecraft environments, Aerospace medicine, Biological effects, Gamma rays, Klebsiella, Physiological responses, Staphylococcus.

For abstract, see STAR 06 12.
N68-22577 HC$3.00 MF$0.65

THEORETICAL AND PRACTICAL IMPORTANCE OF STUDYING THE SERBIAN SPRUCE ECOLOGY,
National Science Foundation, Washington, D. C. Special Foreign Currecny Science Information Program.
For primary bibliographic entry see Field 2F.
TT-67-58008 HC$3.00 MF$0.65

6G. Escape, Rescue, and Survival

EVALUATION OF ONE PIECE WET SUIT.
Test rept.,
Coast Guard Baltimore Md Field Testing and Development Center
C. Cuthrell, and R. E. Buzhardt. 10 May 68, 44p Rept no. 481

Descriptors: (*Underwater clothing, Buoyancy), (*Exposure suits, Acceptability), Performance (Engineering), Flight clothing, Life preservers, Synthetic rubber, Effectiveness, Survival, Fastenings, Photographs, Test methods.

The report covers the evaluation of the flotation capabilities of the two-piece wet suit being used as survival equipment by Coast Guard personnel, a one-piece wet suit and an anti-exposure military flight suit. In addition, the wet suits and the anti-exposure suit were evaluated while wearing supplemental flotation, found necessary for self-righting capability. The report describes the tests conducted and results obtained. The report also describes additional tests conducted to determine if a downed pilot could zip closed the one-piece neoprene wet suit in the water. (Author)
AD-669 230 HC$3.00 MF$0.65

6H. Food

EFFECT OF PROCESSING CONDITIONS IN THE QUALITY OF COOKED, SLICED, FREEZE-DRIED BEEF,
Army Natick Labs Mass Food Lab
J. M. Tuomy, R. L. Stentz, and R. L. Helmer. Apr 68, 15p Rept no. FL-70
USA-NLABS-TR-68-53-FL

Descriptors: (*Beef, Processing), Freeze drying, Dehydrated foods, Meat, Pressure, Storage, Odors, Taste, Temperature, Quality control, Acceptability, Statistical analysis.

The effects of temperature reached in cooking, freezer age before drying, platen temperature, dryer pressure, and time of storage at 100F on the flavor, odor and texture of cooked, sliced, freeze-dried beef were studied. All of the variables significantly affected the organoleptic properties of the dried beef and the overall effect of freeze-drying was a decrease in acceptability. Several significant

statistical interactions were found but, in general, their direction was the same as found for the main effects. Higher cooking temperature and dryer pressure within the ranges studied were found to result in higher organoleptic ratings. Freezer age before drying adversely affected the ratings. Differences in platen temperature resulted in almost no effect between 100 and 150F, but in a significant decrease in ratings from 150 to 200F. As expected, time of storage at 100F resulted in decreased ratings. Significant statistical interactions were found between storage X dehydrator pressure and storage X dehydrator temperature. The interaction of storage X cooking temperature was not significant. This study emphasizes the fact that processing conditions for a product such as cooked, sliced, freeze-dried beef must be carefully controlled to maintain product quality. (Author)
AD-669 618 HC$3.00 MF$0.65

3-A ACCEPTED PRACTICES FOR THE SANITARY CONSTRUCTION, INSTALLATION, TESTING AND OPERATION OF HIGH-TEMPERATURE SHORT-TIME PASTEURIZERS, REVISED.
International Association of Milk, Food and Environmental Sanitarians, Shelbyville, Ind.
Jan 67, 47p
Prepared in cooperation with PHS, and Dairy Industry Committee.

Descriptors: (*Milk, *Pasteurization), (*Industrial plants, Design), Systems engineering, Industrial equipment, Manufacturing methods, Cleaning, Temperature control, Heaters, Cooling, Heat exchangers, Operators (Personnel), Quality control, Reports, Diagrams.

These 3-A Accepted Practices were developed to provide manufacturers, processors, and milk and milk product control authorities with specifications for the proper construction and installation of new High-Temperature Short-Time Pasteurizers, or any components thereof, which may be installed on or after the effective date of these revised Practices.
PB-177 437 HC$3.00 MF$0.65

EXTENDING EMPLOYMENT IN THE PEACH INDUSTRY THROUGH BETTER MARKETING AND MORE PROCESSING.
Georgia Experiment Station, Experiment.
For primary bibliographic entry see Field 5C.
PB-178 026 HC$3.00 MF$0.65

6J. Industrial (Occupational) Medicine

BIOLOGICAL EFFECTS OF RARE, DISPERSED AND OTHER METALS AND THEIR COMPOUNDS USED IN INDUSTRY.
National Research Council of Canada, Ottawa (Ontario).
For primary bibliographic entry see Field 6T.
For abstract, see STAR 06 12.
N68-22476 HC$3.00 MF$0.65

HYGIENE EFFECTS AND CONTROL OF DUSTS, FOGS, GASES, VAPOURS, RADIOACTIVE PARTICLES.
Israel Program for Scientific Translations, Ltd., Jerusalem.
For primary bibliographic entry see Field 13B.
For abstract, see STAR 06 12.
N68-22756 HC$2.00 MF$0.65

HYGIENE EFFECTS AND CONTROL OF DUSTS, FOGS, GASES, VAPOURS, RADIOACTIVE PARTICLES.
Israel Program for Scientific Translations, Ltd., Jerusalem.
For primary bibliographic entry see Field 13B.
For abstract, see STAR 06 12.
N68-23025 HC$2.00 MF$0.65

6K. Life Support

BEHAVIOURAL PROBLEMS IN AEROSPACE MEDICINE.
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 6S.
AD-669 417 HC$3.00 MF$0.65

DEVELOPMENT OF A REGENERABLE CARBON DIOXIDE REMOVAL SYSTEM FINAL REPORT, JUN. 1965 - JAN. 1968.
MSA Research Corp., Evans City, Pa.
W. Samuel, F. Tepper, R. Udavcak, and F. Vancheri. 15 Jan 68, 117p NASA-CR-66571
Contract NAS1-5277

Descriptors: *Carbon dioxide removal, *Ion exchange resins, *Life support systems, Beds (process engineering), Literature, Manned spacecraft, Systems engineering.

For abstract, see STAR 06 12.
N68-21902 HC$3.00 MF$0.65

INVESTIGATION OF HEATLESS ADSORPTION TECHNOLOGY FOR CARBON DIOXIDE CONTROL FOR MANNED SPACECRAFT.
Esso Research and Engineering Co., Linden, N. J. Government Research Div.
J. V. Miceli, and A. Skopp. 1968, 103p NASA-CR-66582
Contract NAS1-6918

Descriptors: *Adsorption, *Carbon dioxide removal, *Life support systems, Air purification, Carbon dioxide concentration, Manned spacecraft, Purging.

For abstract, see STAR 06 12.
N68-21927 HC$3.00 MF$0.65

6L. Medical and Hospital Equipment

FABRICATION TECHNIC FOR AN INFLATABLE NECK SPLINT.
Technical rept.,
Walter Reed Army Medical Center Washington D C Army Medical Biomechanical Research Lab
Mary H. Yeakel, and Douglas K. Ousterhout.
May 68, 24p Rept no. TR-6803

Descriptors: (*Medical supplies, Manufacturing methods), Therapy, Head, Skin, Transplantation, Elastomers, Inflatable structures.

The technic for fabricating a latex inflatable bladder to be used in conjunction with the commercially available Myo Cervical Collar has been described in detail. The latex material used is one which is simple to manipulate and possesses excellent physical properties for this type of application. Due to the dynamic nature of this appliance, a rather small assortment of sizes of both collars and inflatable bladders can be shelf stocked for ready availability to meet patient requirements. (Author)
AD-669 237 HC$3.00 MF$0.65

ARON ALPHA A 'SANKYO,' JAPANESE TISSUE ADHESIVE, IN SURGERY OF INTERNAL ORGANS,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6E.
AD-669 383 Not available from CFSTI.

THE FLEXICON: AN APPROACH TO A LOW COST MEDICAL DISPLAY FOR COMPUTER PROCESSED DATA.
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
For primary bibliographic entry see Field 6E.
PB-178 065 HC$3.00 MF$0.65

6M. Microbiology

THE EFFECT OF STAPHYLOCOCCAL ENTEROTOXIN ON THE FINE STRUCTURE OF THE MONKEY JEJUNUM,
Walter Reed Army Inst of Research Washington D C
Thomas G. Merrill, and Helmuth Sprinz. 1 Nov 67, 11p
Availability: Published in Laboratory Investigation, v18 n2 p114-23 1968.

Descriptors: (*Staphylococcus, Toxins + antitoxins), (*Intestines, *Diseases), Monkeys, Experimental data, Food poisoning, Bacteria, Mucus, Mitochondria, Histological techniques, Morphology (Biology), Biochemistry.

Intragastric administration of a single dose of purified staphylococcal enterotoxin in monkeys produced a lesion confined to mitochondria of villus and crypt epithelial cells and of diverse cells of the tunica propria of the jejunal mucosa. Intestinal microvilli were involved to a lesser degree. The rest of the cellular constituents remained unaffected throughout. The changes which occurred concomitantly with evidence of an acute jejunitis were well developed by 2 hours, reached a maximum at 4 to 8 hours, and regressed from 12 to 24 hours. The changes consisted of swelling of the mitochondria, pallor of the mitochondrial matrix, distortion and dislocation of cristae, and myelin figure formation. The microvilli underwent a transient atrophy. The mitochondrial alterations were manifested as cytoplasmic vacuoles in the light microscope and were the basis of transient decrements of mitochondrial enzymes. It is proposed that cellular integrity is preserved from the utilization of an alternate energy source, possibly the pentose shunt, and that the mitochondria damaged by staphylococcal enterotoxin are capable of reconstruction. (Author)
AD-669 385 Not available from CFSTI.

VIRUSES RECOVERED FROM LABORATORY DOGS WITH RESPIRATORY DISEASE,
Walter Reed Army Inst of Research Washington D C
L. N. Binn, G. A. Eddy, E. C. Lazar, J. Helms, and T. Murname. 1968, 6p
Availability: Published in Viruses in Canine Respiratory Disease p140-5 n.d.

Descriptors: (*Viruses, Laboratory animals), (*Laboratory animals, *Respiratory diseases), Mortality rates, Infectious hepatitis virus, Herpetic viruses, Histology, Pathology, Etiology, Antigen-antibody reactions, Blood analysis, Adenoviruses, Embryonated egg technique, Tissue culture.

Viruses were recovered from throat specimens of 21 of 53 dogs with respiratory disease and from the post-mortem tissues of 7 of 10 dogs. Many of these dogs were infected with more than one agent. The agents were 2 canine adenoviruses, a canine herpes virus and a SV-5-like virus. Rises in antibody titer to the isolated viruses were demonstrated in dogs which survived. The antibody response to the SV-5-like virus was specific to the isolated virus and SV-5 and not to other members of the parainfluenza group. (Author)
AD-669 403 Not available from CFSTI.

DRUG RESISTANCE OF ENTERIC BACTERIA. XII. UNIQUE SUBSTRATE SPECIFICITY OF PENICILLINASE PRODUCED BY R FACTOR,
Gunma Univ Maebashi (Japan) Dept of Microbiology
Ryuki Egawa, Tetsuo Sawai, and Susumu Mitsuhashi. 22 Apr 68, 8p

ARDG (FE)-J-183
Contract DA-92-557-FEC-38283
Availability: Published in Japanese Journal of Microbiology, v11 n3 p173-8 1967.

Descriptors: (*Drugs, Resistance (Biological)), (*Penicillins, Substrates), (*Enterobacteriaceae, Resistance (Biological)), Antibiotics, Escherichia coli, Salmonella, Proteus, Klebsiella, Culture media, Pharmacology.

Five R factors capable of conferring resistance to ampicillin, together with resistance to 4 other drugs, tetracycline (TC), chloramphenicol (CM), streptomycin (SM) and sulfanilamide (SA), were found in Escherichia coli strains isolated from clinical sources. Ampicillin resistance was due to synthesis of penicillinase in the host bacterium which harbored the R factor. The penicillinases produced by three R factors were similar each other in their substrate specificity and were also similar to the enzyme reported by previous workers. The penicillinases produced by 2 other R factors were found to be greatly different from penicillinases reported thus far. The latter were shown to hydrolyse ampicillin and cloxacillin efficiently, but penicillin-G and 6-aminopenicillanic acid to a lesser extent. (Author)
AD-669 406 Not available from CFSTI.

THE ENHANCED RELEASE OF COXSACKIEVIRUS B5 FROM A TRYPSINIZED MONOLAYER OF HEp-2 CELLS,
Defence Chemical Biological and Radiation Establishment Ottawa (Ontario)
Jack Konowalchuk, and Joan I. Speirs. 1968, 6p
Rept no. DCBRE-544
Availability: Published in Canadian Journal of Microbiology, v14 p119-23 1968.

Descriptors: (*Coxsackie virus, Tissue culture cells), Growth, Tissue culture, Morphology (Biology), Canada.

Comparative studies have been made of the extracellular release of coxsackievirus B5 from HEp-2 cells. The latter were maintained as monolayers or as freshly trypsinized cells, kept either in suspension or allowed to settle out. In accordance with some workers we have found that the suspended cells release virus earlier and in larger amounts than monolayer cells. We attribute and attempt to show experimentally that this difference, to a large degree, is the result of the physically round shape of the suspended cell as compared to the varied shape of the monolayer cell. (Author)
AD-669 478 Not available from CFSTI.

QUESTIONS OF THE REPRODUCTION AND DISINFECTION OF VARIOUS MICROORGANISMS.
Joint Publications Research Service, Washington, D. C.
11 Mar 68, 13p
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) n12 p83-7, 91-2 1967.

Descriptors: (*Germicides, Aerosols), (*Corynebacteriaceae, Reproduction (Physiology)), Decontamination, Sterilization, Spores, Staphylococcus aureus, Bacillus anthracis, Water pollution, USSR.

Contents: A study of the bactericidal and sporocidal properties of the aerosols of the new disinfectants; Possibility of erysipelothrix reproduction in an external environment.
JPRS-44639 HC$3.00 MF$0.65

ANTIVIRAL ACTIVITY OF THE ANTIBIOTIC RUBOMYCIN,
Joint Publications Research Service, Washington, D. C.
N. A. Blyumberg, and N. I. Kalamova. 13 Mar 68, 12p
Trans. of Antibiotiki (USSR) v12 n10 p898-903 1967.

Descriptors: (*Antibiotics, Viruses), Ribonucleic acids, Tissue culture, Desoxyribonucleic acids, Toxic tolerance*, Dosage, Influenza virus, Variola virus, Vaccines, USSR.
Identifiers: Rubomycin, Antiviral agents.

Rubomycin reduces the hemagglutination activity of the RNA-containing influenza virus A2 without noticeably affecting the biological activity of this virus in a culture of surviving chorio-allantoic tissue in the organism of hens' embryos and mice. Rubomycin does not suppress the biological activity of another RNA-containing virus: the mouse encephalomyocarditis virus strain MM. Rubomycin suppresses reproduction of the DNA-containing smallpox vaccine virus; it also reduces the biological activity of this virus in experiments on developing hens' embryos and rabbits treated with this antibiotic. (Author)
JPRS-44656 HC$3.00 MF$0.65

EFFECT OF PRE-EXISTING IMMUNITY TO ONE OF THE ANTIGENS OF ASSOCIATED VACCINE AGAINST PLAGUE, TULAREMIA, AND BRUCELLOSIS ON IMMUNIZING PROPERTIES OF ITS OTHER COMPONENTS. REPORT IV,
Joint Publications Research Service, Washington, D. C.
V. G. Pilipenko. 21 Mar 68, 9p
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) n1 p50-4 1968.

Descriptors: (*Pasteurella, Vaccines), (*Brucella, Vaccines), (*Vaccines, Effectiveness), Pasteurella tularensis, Pasteurella pestis, Mixtures, Antigens + antibodies, Immunity, USSR.

The presence of pre-existing immunity to plague and brucellosis among guinea pigs does not reduce the effectiveness of administration of tularemia antigen as part of associated vaccine against plague, tularemia, and brucellosis. Formation of immunity among guinea pigs against tularemia derived on the same level as in animals inoculated with trivaccine that were not subjected to preliminary immunization with brucellosis-plague bivaccine, or as in animals inoculated with tularemia monovaccine. (Author)
JPRS-44756 HC$3.00 MF$0.65

VACCINATION AGAINST TRACHOMA,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 6E.
JPRS-44779 HC$3.00 MF$0.65

VIRUSES ISOLATED FROM BEAGLE DOGS EXPOSED TO AEROSOLS OF 90 Sr AND 144 Ce.
Technical progress rept.,
Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex. Dept. of Microbiology.
D. L. Lundgren, W. E. Clapper, and A. Sanchez. Oct 67, 21p
Contract AT (29-2)-1013

Descriptors: (*Viruses, Dogs), Coxsackie virus, Echo virus, Radiation effects, Tissue culture, Antigens + antibodies, Virus diseases.

For abstract, see NSA 22 10.
LF-36 HC$3.00 MF$0.65

A SYSTEMS APPROACH TO CONTAMINATION CONTROL.
Sandia Corp., Albuquerque, N. Mex. Systems Studies Div.
C. A. Trauth, Jr.. Apr 68, 38p NASA-CR-94357, SC-M-68-235
NASA ORDER R-09-019-040

Descriptors: *Decontamination, *Spacecraft contamination, *Sterilization, *Systems engineering, Activity (biology), Bioassay, Cost estimates, Microbiology.

For abstract, see STAR 06 12.
N68-22442 HC$3.00 MF$0.65

STERILIZATION ASSEMBLY DEVELOPMENT LABORATORY. PERSONNEL PROCEDURES FOR SADL OPERATIONS - JPL PROCEDURE SADL 201.00.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. J. Lunney, and H. C. Schwartz. 15 Apr 67, 12p NASA-CR-94383, AVSSD-0130-67-CR
Contract NAS7-100
Prep- Prepared for Jpl

Descriptors: *Clean rooms, *Controlled atmospheres, *Spacecraft sterilization, Environmental control, Environmental laboratories, Operators (personnel), Purification, Quality control.

For abstract, see STAR 06 12.
N68-22517 HC$3.00 MF$0.65

STERILIZATION ASSEMBLY DEVELOPMENT LABORATORY - QUALITY ASSURANCE PROGRAM PLAN.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
L. A. Paquin. 15 Aug 67, 86p NASA-CR-94384, AVSSD-0129-67-CR, REV. 1
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Clean rooms, *Quality control, *Spacecraft sterilization, Controlled atmospheres, Environmental control, Environmental laboratories, Equipment specifications, Purification.

For abstract, see STAR 06 12.
N68-22518 HC$3.00 MF$0.65

STERILIZATION ASSEMBLY DEVELOPMENT LABORATORY - MONITORING PLAN.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
J. B. Mathews. 15 Aug 67, 180p NASA-CR-94341, AVSSD-0317-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Clean rooms, *Controlled atmospheres, *Spacecraft sterilization, Environmental control, Environmental laboratories, Equipment specifications, Purification, Quality control.

For abstract, see STAR 06 12.
N68-22519 HC$3.00 MF$0.65

A STUDY OF CHEMICAL RESIDUES LEFT ON SURFACES AFTER BIOLOGICAL ASSAY PROCEDURES, PHASE 2.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
W. Gillchriest. 15 Jul 67, 20p NASA-CR-94372, AVSSD-0318-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Bioassay, *Chemical cleaning, *Residues, *Spacecraft sterilization, Contamination, Microbiology, Microorganisms, Space capsules, Subassemblies.

For abstract, see STAR 06 12.
N68-22520 HC$3.00 MF$0.65

STERILIZATION ASSEMBLY DEVELOPMENT LABORATORY. A STUDY OF THE MICROBIAL BURDEN ACCUMULATED ON ASSEMBLIES BUILT IN EASL UNDER DISRUPTED VERTICAL AIRFLOW.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.

E. M. Hajema. 15 Aug 67, 35p NASA-CR-94339, AVSSD-0319-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Laminar flow, *Microorganisms, *Spacecraft sterilization, *Subassemblies, Disrupting, Microbiology, Space capsules, Vertical air currents.

For abstract, see STAR 06 12.
N68-22522 HC$3.00 MF$0.65

STERILIZATION ASSEMBLY DEVELOPMENT LABORATORY. DEVELOPMENT OF PROCEDURES FOR ESTIMATING THE CMTM MICROBIAL BURDEN.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
30 Sep 67, 316p NASA-CR-94338, AVSSD-0378-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Microorganisms, *Space capsules, *Spacecraft sterilization, *Subassemblies, Bibliographies, Microbiology, Probability theory, Project management, Statistical tests.

For abstract, see STAR 06 12.
N68-22523 HC$3.00 MF$0.65

CMTM BIOLOGICAL MONITORING PLAN, PHASE 2.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
P. A. Kales. 10 Oct 67, 94p NASA-CR-94370, AVSSD-0323-67-CR, REV. 1
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Bioassay, *Samplers, *Spacecraft sterilization, Clean rooms, Microorganisms, Monitors, Space capsules, Spacecraft structures, Subassemblies.

For abstract, see STAR 06 12.
N68-22524 HC$3.00

EXPERIMENTAL ASSEMBLY AND STERILIZATION LAB - IDENTIFICATION OF MICROBIOLOGICAL ISOLATES.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. A. Botan. 15 Apr 67, 30p NASA-CR-94337, AVSSD-0128-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Bioassay, *Environmental laboratories, *Microbiology, *Morphology, Assembling, Bacteriology, Biochemistry, Chemical sterilization, Decontamination.

For abstract, see STAR 06 12.
N68-22531 HC$3.00 MF$0.65

DETERMINATION OF THE HEAT RESISTANCE OF MICROBIAL ISOLATES FROM EASL.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
H. DE.King. 15 Apr 67, 35p NASA-CR-94340, AVSSD-0148-67-CR
Contracts NAS7-100, JPL-951624

Descriptors: *Bioassay, *Environmental laboratories, *Microbiology, *Spores, *Thermal resistance, Assembling, Bacteriology, Biochemistry, Chemical sterilization, Decontamination, Microorganisms, Morphology.

For abstract, see STAR 06 12.
N68-22532 HC$3.00 MF$0.65

EXPERIMENTAL ASSEMBLY AND STERILIZATION LAB. MICROBIOLOGICAL ASSAY AND CERTIFICATION OF SPACECRAFT HARDWARE STERILITY - JPL PROCEDURE EASL 300.01.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. A. Botan. 15 Apr 67, 30p NASA-CR-94379, AVSSD-0134-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Bioassay, *Microorganisms, *Project management, *Spacecraft sterilization, Air sampling, Assemblies, Certification, Hardware, Management planning, Microbiology, Samplers.

For abstract, see STAR 06 12.
N68-22635 HC$3.00 MF$0.65

STUDY OF CHEMICAL GERMICIDES.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. A. Botan, and T. H. Rider. 15 Apr 67, 19p NASA-CR-94380, AVSSD-0133-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Bactericides, *Chemical cleaning, *Spacecraft sterilization, Bioassay, Microbiology, Microorganisms, Spacecraft components.

For abstract, see STAR 06 12.
N68-22680 HC$3.00 MF$0.65

EXPERIMENTAL ASSEMBLY AND STERILIZATION LAB. PROCESS SPECIFICATION FOR DECONTAMINATION OF COMPONENT PARTS, TOOLS AND EQUIPMENT - JPL PROCEDURE EASL 200.01.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. A. Botan. 15 Apr 67, 14p NASA-CR-94356, AVSSD-0132-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Materials handling, *Project management, *Spacecraft components, Dry heat, Ethylene oxide, Management planning, Spacecraft contamination, Spacecraft sterilization.

For abstract, see STAR 06 12.
N68-22681 HC$3.00 MF$0.65

STERILIZATION ASSEMBLY DEVELOPMENT LABORATORY - ROUTINE CLEANING AND DECONTAMINATION OF THE SADL FACILITY.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. A. Botan, and E. J. Lunney. 15 Apr 67, 16p NASA-CR-94381, AVSSD-0136-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Bactericides, *Chemical cleaning, *Project management, *Spacecraft sterilization, Assembling, Clean rooms, Cleaners, Management planning, Microbiology.

For abstract, see STAR 06 12.
N68-22682 HC$3.00 MF$0.65

STUDY OF THE PLATEAU OF MICROBIOLOGICAL CONTAMINATION ON SURFACES.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. A. Botan. 15 Apr 67, 49p NASA-CR-94342, AVSSD-0149-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Laminar flow, *Mesophiles, *Spores, Bacillus, Contamination, Death, Escherichia, Staphylococcus.

For abstract, see STAR 06 12.
N68-22759 HC$3.00 MF$0.65

STUDY OF THE ETIOLOGY OF HUMAN LEUKEMIA IN EXPERIMENTS ON PRIMATES (PART II),
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
For primary bibliographic entry see Field 6E.
PB-178 135T HC$3.00 MF$0.65

HEMPITERA, FLEAS, AND TICKS AS CARRIERS OF THE VIRUS OF EXANTHEMATOUS TYPHUS IN EXPERIMENTAL CONDITIONS,
National Institutes of Health, Bethesda, Md. Translating Unit, Library.
For primary bibliographic entry see Field 6C.
PB-178 139T HC$3.00 MF$0.65

DIFFERENTIATION OF STREPTOCOCCUS PLUTON AND BACTERIUM PLUTON (DIFFERENTSIATSIYA STREPTOCOCCUS PLUTON I BACTERIUM PLUTON).
National Agricultural Library, Beltsville, Md. Bee Culture Branch.
Jan 68, 3p
Trans. of Veterinariya (USSR) v43 n6 p25-6 1966.

Descriptors: (*Streptococcus, Identification), (*Lactobacillus, Identification), Morphology (Biology), Culture media, Growth, Veterinary medicine, Infectious diseases.
Identifiers: Translations, European foulbrood.
PB-178 152T HC$3.00 MF$0.65

6N. Personnel Selection and Maintenance (Medical)

STUDY OF WORK-PRODUCING CHARACTERISTICS OF UNDERWATER OPERATIONS.
North American Rockwell Corp Downey Calif Space Div
For primary bibliographic entry see Field 5J.
AD-669 512 HC$3.00 MF$0.65

6O. Pharmacology

A LONGITUDINAL ANALYSIS OF THE REFRACTIVE CHARACTERISTICS OF CHIMPANZEES.
Technical rept.,
Aeromedical Research Lab. (6571st), Holloman AFB, N. Mex.
Donald N. Farrer. Mar 65, 12p 6571-ARL-TR-65-1

Descriptors: (*Chimpanzees, *Eye), Anesthesia, Aging (Physiology), Refraction, Vision.

Sixty chimpanzees, 34 males and 26 females ranging in age from less than 3 years to 10 years old, were refracted in the supine position under sernyl (proprietary preparation of Park-Davis and Company) anesthesia and cyclogyl cycloplegia. Intraocular pressures were obtained under the same conditions. The tendency toward increasing minus refractive error as a function of age was confirmed, and a statistically significantly lower intraocular tension in the males was found. Intraocular tension increased statistically significantly in the 24 month test-retest design. It was concluded that sernyl anesthesia yields no contraindictions for the continued use of this anethetic for the evaluation of the refractive status of the chimpanzee. (Author)
AD-459 570 HC$3.00

CLINICAL, LABORATORY AND FIELD STUDIES ON DRUG RESISTANCE OF PLASMODIUM FALCIPARUM.

Quarterly rept. no. 1,
Instituto Brasileiro de Tropicologia Medica Rio de Janeiro
Jose Rodrigues da Silva. Mar 68, 8p
Grant DAHC19-67-G-0009

Descriptors: (*Antimalarials, Resistance (Biological)), Plasmodium, Parasitic diseases, Chemotherapy, Cinchona alkaloids, Effectiveness, Brazil.

The report details clinical experience with 5 patients naturally infected with P. vivax, 2 with P. falciparum (natural infection), and experimental infection of two neurosyphilitic patients with a new strain of P. falciparum from Goias State, Brazil. All infections were resistant to standard drug therapy. (Author)
AD-669 249 HC$3.00 MF$0.65

DRUG RESISTANCE OF ENTERIC BACTERIA. XII. UNIQUE SUBSTRATE SPECIFICITY OF PENICILLINASE PRODUCED BY R FACTOR,
Gunma Univ Maebashi (Japan) Dept of Microbiology
For primary bibliographic entry see Field 6M.
AD-669 406 Not available from CFSTI.

QUINOLINE ANTIMALARIALS.
Annual rept. 5 May 67-4 May 68,
Virginia Univ Charlottesville Dept of Chemistry
Robert E. Lutz. 4 May 68, 35p
Contract DA-49-193-MD-2955
See also AD-669 647 thru AD-669 650.

Descriptors: (*Antimalarials, Quinolines), (*Quinolines, Synthesis (Chemistry)), Fluorine compounds, Methanols, N-heterocyclic compounds, Amines, Ketones, Nitriles, Carboxylic acids.
Identifiers: Quinoline methanols.

Contents: The 2-trifluoromethyl-4-quinoline-(alpha-aminoalkyl)-methanols; The feasibility of some new synthetic routs toward target compounds; Preparation of some substituted 4-quinoline- (alpha-alkylamino)methanols without the 2-aryl group and with the 2-position unsubstituted; 2- (p-substituted-phenyl)-quinoline (alpha-aminoalkyl)methanols; 2-arylquinoline-4- (alpha-aminoalkyl)methanols carrying a substituent in the 3-position; 2-perfluorophenyl-quinoline-4- (alpha-aminoalkyl)methanols; 4-quinoline- (alpha-aminoalkyl)methanols carrying a 2-heteroelemental group; 2,3-dimethylene-4-quinoline- (alpha-aminoalkyl)methanols; 2,3-methylene-4- (alpha-aminoalkyl)methanols.
AD-669 425 HC$3.00 MF$0.65

PYRIDYL KETONES BY ADDITION OF PYRIDYLLITHIUM TO CARBOXYLIC ACIDS. A NEW SYNTHESIS OF ALPHA- (2-PIPERIDYL)-2-ARYL-4-QUINOLINEMETHANOLS,
Virginia Univ Charlottesville Dept of Chemistry
D. W. Boykin, A. R. Patel, R. E. Lutz, and A. Burger. Sep 67, 2p
Contract DA-49-193-MD-2955
Availability: Published in Journal of Heterocyclic Chemistry, v4 p459-60 1967.

Descriptors: (*Antimalarials, Quinolines), (*Quinolines, Synthesis (Chemistry)), Pyridines, Ketones, Piperidines, Methanols, Carboxylic acids, Addition reactions.
Identifiers: Piperidyl quinoline methanols, Quinoline methanols.

Resurgence of the malaria problem led to the synthesis a number of the title compounds, a type which had previously been made by a cumbersome 6-step synthesis from the corresponding quinoline-4-carboxylic acids. A new and more convenient 2-step synthesis is reported by which fifteen alpha-(2-piperidyl)-2-aryl-quinolinemethanols were made in the 6-methyl, 8-methyl, 6,8-dimethyl and 8-trifluoromethyl series. Also, by a variant in the second step, twenty alpha- (2-pyridyl) analogs were made which represent a new class of potential synthetic medicinals, but which appear to be inactive toward malaria.
AD-669 647 Not available from CFSTI.

ANTIMALARIALS. II. ALPHA- (2-PIPERIDYL)- AND ALPHA- (2-PYRIDYL)-2-TRIFLUOROMETHYL-4-QUINOLINE-METHANOLS,
Virginia Univ Charlottesville Dept of Chemistry
Roger M. Pinder, and Alfred Burger. 1967, 3p
Contract DA-49-193-MD-2955
See also AD-669 647.
Availability: Published in Journal of Medicinal Chemistry v11 p267 1968.

Descriptors: (*Antimalarials, Quinolines), (*Quinolines, Synthesis (Chemistry)), Methanols, Pyridines, Piperidines, Fluorine compounds, Halogenated hydrocarbons, Plasmodium, Lethal dosage.
Identifiers: Pyridyl trifluoromethyl quinoline methanols, Piperidyl trifluoromethyl quinoline methanols, Quinoline methanols.

A series of alpha- (2-piperidyl)-2-trifluoromethyl-4-quinolinemethanols was synthesized in the hope that replacement of 2-aryl by 2-CF3 would decrease the photosensitizing qualities of the 2-aryl analogs. All of the 2-trifluoromethyl derivatives carrying 6- or 8-CH3, -CH3O, or -Cl substituents increased the survival time of mice infected with Plasmodium berghei, but they retained photosensitizing properties, albeit less than the 2-aryl-substituted analogs. (Author)
AD-669 648 Not available from CFSTI.

ANTIMALARIALS. III. BENZOTHIAZOLE AMINO ALCOHOLS,
Virginia Univ Charlottesville Dept of Chemistry
Alfred Burger, and S. N. Sawhney. 1968, 4p
Rept no. Contrib-298
Contract DA-49-193-MD-2955
See also AD-669 648.
Availability: Published in Journal of Medicinal Chemistry, v11 p270-3 Mar 1968.

Descriptors: (*Antimalarials, Heterocyclic compounds), (*N-heterocyclic compounds, Synthesis (Chemistry)), (*S-heterocyclic compounds, Synthesis (Chemistry)), Amines, Alcohols, Fluorine compounds, Halogenated hydrocarbons, Plasmodium, Lethal dosage, Quinolines, Substitutes.
Identifiers: Benzthiazole amino alcohols.

Amino alcohols carrying a CHOH (CH2)1-3NR2 chain in position 6 of a benzothiazole nucleus, unsubstituted or substituted by phenyl or trifluoromethyl in the 2 position, were synthesized by standard methods and tested for activity against Plasmodium berghei in mice. Several of the amino alcohols showed weak antimalarial activity but only at toxic doses. (Author)
AD-669 649 Not available from CFSTI.

ANTIMALARIALS. IV. A NEW SYNTHESIS OF ALPHA- (2-PYRIDYL)- AND ALPHA- (2-Piperidyl)-2-ARYL-4-QUINOLINEMETHANOLS,
Virginia Univ Charlottesville Cobb Chemical Lab
D. W. Boykin, Jr., A. R. Patel, and R. E. Lutz.
Mar 68, 5p Rept no. Contrib-311
Contract DA-49-193-MD-2955
See also AD-669 649.
Availability: Published in Journal of Medicinal Chemistry, v11 p273-7 Mar 1968.

Descriptors: (*Antimalarials, Quinolines), (*Quinolines, Synthesis (Chemistry)), Pyridines, Piperidines, Methanols, Carboxylic acids, Addition reactions, Hydrogenation, Plasmodium, Lethal dosage.
Identifiers: Pyridyl quinoline methanols, Piperidyl quinoline methanols, Quinoline methanols.

New convenient syntheses of alpha- (2-pyridyl)- and alpha- (2-piperidyl)--2-aryl-4-quinolinemethanols are reported. The key steps involve addition of pyridyllithium to quinoline-4-carboxylic acids and subsequent one-step selective catalytic 8 H hydrogenation of the ketopyridyl system to the alpha-piperidylmethanol. All of the alpha-piperidyl-methanols were highly active against Plasmodium berghei in mice but were phototoxic, whereas the alpha-pyridyl analogs were considerably less phototoxic but were inactive. (Author)
AD-669 650 Not available from CFSTI.

PUNCHED CARD PRESCRIPTION ANALYSIS AND COST ACCOUNTING OF PHARMACIES,
Joint Publications Research Service, Washington, D. C.
I. K. Agalakova, F. A. Konev, and M. N. Vushkova. 13 Feb 68, 22p
Trans. of Farmatsiya (USSR) n6 p6-18 1967.

Descriptors: (*Pharmacology, *Punched cards), (*Management control systems, Pharmacology), Analysis, Costs, Computers, Budgets, Economics, USSR, Commerce, Data processing systems.
Identifiers: Pharmacies, Cost accounting.

Contents: Value of computers in the management of pharmacies; Punched card analysis of ex tempore prescriptions compounded at pharmacies; All hospital pharmacies should be operated on a cost accounting basis.
JPRS-44354 HC$3.00 MF$0.65

ANTIVIRAL ACTIVITY OF THE ANTIBIOTIC RUBOMYCIN,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 6M.
JPRS-44656 HC$3.00 MF$0.65

RADIOBIOLOGICAL STUDY OF THE RADIOPROTECTIVE ACTIVITY OF A NATURAL IRANIAN PRODUCT - " SHIR- KHECHT".
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France).
For primary bibliographic entry see Field 6R.
For abstract, see STAR 06 12.
N68-22700 HC$3.00 MF$0.65

PLANT REQUIREMENTS FOR MANUFACTURE OF PHARMACEUTICAL PRODUCTS.
International Cooperation Administration, Washington, D. C. Technical Aids Branch.
For primary bibliographic entry see Field 13H.
PB-178 062 HC$3.00 MF$0.65

6P. Physiology

SELF-REGULATION OF HIGHER NERVOUS ACTIVITY,
Foreign Technology Div Wright-Patterson AFB Ohio
A. A. Krauklis. 6 Dec 67, 299p Rept no. FTD-HT-23-808-67
Unedited rough draft trans. of mono. Samoregulyatsiya Vysshei Nervnoi Deyatelnosti, Riga 1964 p1-291.

Descriptors: (*Central nervous system, Medical research), Nervous system, Brain, Nerve cells, Motor reactions, Physiology, Muscle relaxants, Reflexes, Mental disorders, Neuroses, Psychology, Psychophysiology, USSR.
Identifiers: Translations.

Self-regulation of the nervous system by means of conditioned reflex reproduction of effector reactions 'advantageous' for so-called compensatory reactions guarantees the conservation of an optimal regimen and adequate level of integration of higher nervous system activity in animals and, in particular, in man. The adequacy and economy of these mechanisms in most connections depends on the adaptive effectiveness of all psychic human activities. Therefore, the problem of improving and stabilizing the self-regulation of higher nervous activity is the basic physiological content of human psychohygiene and psychoprophylaxis. In the present work the possible physiological me-

chanisms for the self-regulation of higher nervous activity are examined in animals and in man, as well as the significance of disturbances of these mechanisms in the function of internal organs. (Author)
AD-669 273 HC$3.00 MF$0.65

OSCILLATORY BEHAVIOR OF HEART RATE, VENTILATION AND SKIN TEMPERATURE IN RESTING HUMANS: TOWARDS A SPECTRAL ANALYZER.
Final rept. 1 May 66-1 Aug 67,
General Technical Services Inc Upper Darby Pa
M. H. Halpern, E. D. Young, and M. H. Ehrenberg. Jan 68, 49p
AMRL-TR-67-228
Contract AF 33 (615)-3917

Descriptors: (*Electrophysiology, Monitors), Instrumentation, Cardiovascular system, Respiration, Body temperature, Pulse rate, Exercise, Relaxation (Physiology), Data processing systems, Metabolism, Rhythm (Biology), Ingestion (Physiology), Stress (Physiology), Mathematical analysis.
Identifiers: Bioinstrumentation.

The physiological responses of human subjects were studied to determine the oscillatory frequencies of these responses. Heart rate, ventilation rate, and surface temperature were monitored from three subjects during quiescence and light exercise under conditions of fasting and immediately after food intake. A pattern of rhythmical oscillations was found for each of the three physiological parameters which varied with the specific experimental conditions. The method of handling the data and extracting the oscillations from the raw data is discussed in detail. The mathematical basis of this method is presented. Possible other applications of these techniques to data handling, compression, and reduction are also examined. (Author)
AD-669 361 HC$3.00 MF$0.65

CORTICOSPINAL FIBERS IN NEW WORLD AND OLD WORLD SIMIANS,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6C.
AD-669 384 Not available from CFSTI.

EFFECTS OF EXERCISE AND ITS CESSATION ON THE HEART AND ITS BLOOD SUPPLY,
Walter Reed Army Inst of Research Washington D C
Arthur S. Leon, and Colin M. Bloor. Apr 68, 7p
Availability: Published in Journal of Applied Physiology, v24 n4 p485-90 1968.

Descriptors: (*Heat, *Blood circulation), (*Exercise, *Cardiovascular system), Muscles, Arteries, Capillaries, Laboratory animals, Weight, Histology.
Identifiers: Capillary fiber ratio, Cardiac hypertrophy.

Studies were carried out in rats on effects of daily and intermittent exercise and its cessation on heart size and on cross-sectional luminal areas of extracoronary collateral (ECA) and coronary arteries (CA) and on capillary-ventricular muscle fiber ratios (CFR). For 10 weeks young male rats swam for 1-hr periods daily (I) or twice weekly (II). These animals and unexercised controls were sacrificed at the end of 10 weeks exercise or 14-42 days following cessation of exercise. Ventricular dry weights were determined, ventricular-body weight ratios calculated, and histological sections prepared. At the end of the exercise period, body weights in both I and II were below controls. Cardiac hypertrophy with an associated increase in CA area was observed only in I. ECA areas and CFR were significantly increased over control levels in both groups. After cessation of exercise, ventricular weights regressed rapidly, dipping transiently below control levels at 14-28 days, while body weights increased markedly. Following this initial drop, ventricular weight increased along with body weight. Although CA area regressed at about the same rate as ventricular weight, ECA area and CFR remained significantly greater than controls in I at 42 days postexercise. (Author)
AD-669 387 Not available from CFSTI.

A 50 s RIBOSOMAL DETERMINANT: IMMUNOLOGICAL STUDIES CORRELATING FUNCTION AND STRUCTURE.
Revised ed.,
Walter Reed Army Inst of Research Washington D C
David I. Friedman, John G. Olenick, and Fred E. Hahn. 2 Dec 67, 11p
Revision of report dated 17 Jul 67.
Availability: Published in J. Mol. Biol., v32 p579-86 1968.

Descriptors: (*Ribosomes, *Molecular structure), Structural properties, Immunology, Immune serums, Electrophoresis, Ribonucleic acids, Amines, Separation.
Identifiers: *Binary sites, Nucleosides.

Ribosomes sedimented to equilibrium in cesium chloride are partially stripped of proteins and result in particles having sedimentation coefficients of 40 s and 23 s. Preparations of 50 s ribosomal subunits from Escherichia coli were banded in cesium chloride, and the split proteins were used to obtain specific antiserum. This antiserum reacted with 50 s subunits and 70 s ribosomes; core (40 and 23 s) particles and 30 s subunits were nonreactive. Only 50 s ribosomal subunits isolated from bacteria taxonomically related to E. coli displayed similar immunological reactivity. Immunoelectrophoretic analyses demonstrated one precipitin band, suggesting that the antiserum was specific for a 50 s split protein determinant. Ribosomes pre-incubated with sRNA exhibited a significant reduction in serological reactivity. Soluble RNA preparations were oxidized by periodate and were exposed to cyclohexylamine, a treatment known to remove the terminal nucleoside and to result in a drastic reduction of sRNA binding to ribosomes. When such an sRNA preparation was used in the pre-incubation, no protection was afforded, and the ribosomes showed the usual serological reactivity. These results indicate that the 50 s split protein determinant studied was located near, or was perhaps identical to, the sRNA binding site. (Author)
AD-669 390 Not available from CFSTI.

SYMPATHETIC CONTROL OF THE CORONARY CIRCULATION IN THE UNANESTHETIZED DOG,
Walter Reed Army Inst of Research Washington D C
B. Pitt. 1967, 10p
Availability: Published in International Symposium on the Coronary Circulation and Energetics of the Myocardium, Milan, p89-97 1966.

Descriptors: (*Chemoreceptors, Cardiovascular system), (*Heart, Blood circulation), Blood volume, Arteries, Autonomic nervous system, Pulse rate, Blood pressure, Sympatholytic agents, Vasoactive agents, Metabolism, Exercise.

The contribution of beta adrenergic augmentation to the coronary circulation was examined in a variety of circumstances. In the unanesthetized dog, beta sympathetic tone appears to contribute only minimally to the resting coronary blood flow. Pharmacologic elimination of the sympathetic coronary artery tone failed to abolish the reactive hyperemic response of the myocardium. These studies suggest a metabolic rather than a neurologic mechanism as the cause of myocardial reactive hyperemia. Sympathetic augmentation also does not appear to play any significant role in the hemodynamic adjustments to increases in ventricular rate within the optimum range for cardiac output. At high ventricular rates, beta adrenergic stimulation may, however, play an important role as evidenced by a decreased threshold for the appearance of mechanical ventricular alternans after beta blockade. Beta blockage can modify the hemodynamic response to excitement both by inhibiting cardioacceleration and stroke flow. The hemodynamic response to exercise is also modified by beta blockade. After beta blockade, the same submaximal treadmill work may be performed at a lower level of CBF, cardiac work, tension time index, mean ventricular and peak ventricular ejection rate than prior to beta blockade. It would, therefore, appear that beta sympathetic augmentation is unnecessary for the performance of submaximal exercise in the normal animal and may be considered as an overshoot phenomenon with a resulting waste of CBF and cardiac work. At maximal levels of exercise, sympathetic augmentation may, however, play an important role, as evidenced by a decreased exercise tolerance after beta blockade. (Author)
AD-669 401 Not available from CFSTI.

TEMPERATURE TAKING TIMES IN VIETNAM,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6E.
AD-669 402 Not available from CFSTI.

VIRUSES RECOVERED FROM LABORATORY DOGS WITH RESPIRATORY DISEASE,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6M.
AD-669 403 Not available from CFSTI.

BIOCHEMICAL PROFILE OF NERVE MEMBRANE.
Annual rept. no. 3,
Chile Univ Santiago Laboratorio de Biofisica
Mitzy Canessa-Fischer, Fernando Vargas, Italo Zamudio, Fernando Zambrano, and Marla Cellino. Feb 68, 14p
AFOSR-68-1000
Grant AF-AFOSR-788-67

Descriptors: (*Nerve cells, Cephalopoda), Membranes (Biology), Electrophysiology, Optic nerve, In vitro analysis, Transport properties, Enzymes, Molecular structure, Rubidium, Metabolism, Chile.

A multi-disciplinary approach was used to study the molecular structure and function of nerve membrane in the Chilean squid. Intracellular perfused giant axons were used (1) to study anions and substrate requirements which allow the recovery of the active transport of sodium ions; and (2) to determine the presence of fixed negative charges in the matrix of axon membrane. Intact axons were used to study the transport of rubidium and its relationship with metabolism. Axons isolated from the optic tract of the squid eyes were used to devise a large scale preparation of nerve membranes which will permit the study of its molecular organization. (Author)
AD-669 534 HC$3.00 MF$0.65

BIOMECHANICS: ITS SCOPE, HISTORY, AND SOME PROBLEMS OF CONTINUUM MECHANICS IN PHYSIOLOGY.
Interim rept.,
California Univ San Diego La Jolla Dept of the Aerospace and Mechanical Engineering Sciences
Yuan-Cheng B. Fung. 3 Apr 68, 22p
AFOSR-68-0993
Grants AF-AFOSR-1186-67, NSF-GK-1415
Availability: Published in Applied Mechanics Reviews, v21 n1 p1-19 1968.

Descriptors: (*Biophysics, Reviews), (*Physiology, Continuum mechanics), Stresses, Tissues (Biology), Boundary value problems, Strain (Mechanics), Blood circulation, Propagation, Capillaries, Erythrocytes, History, Bibliographies.
Identifiers: Biomechanics.

Biomechanics is mechanics applied to biology. In this survey the historical development of biomechanics is outlined. In reviewing recent developments, emphasis is laid on continuum mechanics in physiology. The stress-strain-history law of soft tissues is discussed. Boundary value problems in circulation physiology are reviewed. A bibliography is presented at the end of the paper. (Author)
AD-669 539 Not available from CFSTI.

DISTRIBUTION OF BIOLOGICALLY ACTIVE COMPOUNDS WITHIN THE BODY.
Progress rept. no. 1, 1 Mar-31 Aug 67,
Karolinska Institutet Stockholm (Sweden) Dept of Physiology
U. S. von Euler. 27 Sep 67, 6p
AFOSR-68-0999
Grant AF-EOAR-18-67

Descriptors: (*Amines, *Autonomic nervous system), Nerve cells, Granules, Membranes (Biology), Levarterenol, Inhibition, Adenosine phosphates, Labeled substances, Tracer studies, Chemoreceptors, Local anesthetics, Neuromuscular transmission, Distribution, Tissues (Biology), Sweden.
Identifiers: Catecholamines.

The report deals with the study of uptake and release processes of catecholamines in isolated granules from adrenergic nerves. Summaries of four current research projects are presented.
AD-669 553 HC$3.00 MF$0.65

THE EFFECTS OF STRESS HORMONE UPON THE CATABOLISM OF DERMAL COLLAGEN.
Annual progress rept.,
Children's Hospital Washington D C Biochemical Research Lab
John C. Houck, C. DeHesse, and R. Jacob. May 68, 30p
Grants DAHC19-67-G-0020, DA-ARO-49-09-66-G-121
Availability: Published in Symposium of the Society for Experimental Biology (21st) Sheffield (England), p403-26 1967.

Descriptors: (*Collagen, Metabolism), Adrenal cortex hormones, Stress (Physiology), Aging (Physiology), Skin, Enzymes, Enzyme inhibitors, Proteins, Biosynthesis, Tissue culture, Tissue extracts, Body weight, Glycogen, Liver, In vitro analysis.

It was shown that in response to stress and stress hormone administration, rat skin loses as much as 1/3 of its insoluble collagen concentration. This collagen is catabolized by a collagenolytic enzyme unique to the skin which is induced within the fibroblast. This induction of collagenolytic activity can be demonstrated in monolayer cultures of both human and rodent fibroblasts and is a result of the derepression of an operon within these cells by stress hormone (cortisol) or any other corticosteroid possessing a beta-11 hydroxy group. Isotopically labeled skin collagen when transplanted into another rat which is then stressed is catabolized in this fashion from the skin, and the collagen derived isotope can be found in the glycogen of the liver of the host animal. This suggests a hither-to unknown metabolic role for cutaneous collagen. (Author)
AD-669 555 Not available from CFSTI.

SUBJECTIVE AND ELECTROMYOGRAPHIC ASSESSMENT OF ISOMETRIC MUSCLE CONTRACTIONS.
Interim rept.,
Army Medical Research Lab Fort Knox Ky
Andree J. Lloyd, Joseph H. Voor, and Thomas Thieman. 26 Mar 68, 14p Rept no. USAMRL-772

Descriptors: (*Fatigue (Physiology), *Electromyography), Muscles, Strength, Endurance, Pain, Contraction, Psychophysiology, Performance (Human), Stress (Physiology).

Forty male subjects were asked to pull either 25% or 50% of their maximal voluntary contraction on an isometric dynamometer handle. During the pull, they were asked to rate the pain experienced in the muscles on a five-point scale. During the task, the active muscle was continuously monitored by an EMG. The results indicated that individuals are able to predict their maximal endurance when concentrating on a dominant stimulus in a physical task. The EMG analyses indicated that a differentiation can be made between physiological and psychological aspects of fatigue. The point in time when the EMG significantly increased in amplitude is interpreted to be the time when, due to motor unit impairment, the active muscle is fatigued. Additional contraction time was proposed to result from cortical recruitment, the length of which was determined by motivational elements. (Author)
AD-669 595 HC$3.00 MF$0.65

ROLE OF SINO-AORTIC REFLEXES IN THE REGULATION OF EXPERIMENTAL RENAL HYPERTENSION DURING NATURAL SLEEP,
Milan Univ (Italy) Istituto Di Patologia Medica
A. Zanchetti, M. Guazzi, and G. Baccelli. 2 May 68, 16p
AFOSR-68-0943
Grant AF-EOAR-6-65
Availability: Published in Baroreceptors and Hypertension, Proceedings of an International Symposium, Dayton, Ohio, p387-400 Nov 16-17 1967.

Descriptors: (*Sleep, *Blood pressure), Hypertension, Hypotension, Arteries, Autonomic nervous system, Reflexes, Electrophysiology, Electroencephalography, Electromyography, Blood circulation, Analysis of variance, Italy.

A very marked hypotension occurring during deep (REM) sleep in renal hypertensive cats after sinoaortic deafferentation shows that the neural control of circulation is working with great efficiency even in renal hypertensive animals. (Author)
AD-669 636 Not available from CFSTI.

ALIMENTARY BEHAVIOR AND ORGANIC ADAPTION TO DESERT ZONES.
Comportement Alimentaire Et Adaptation Organique en Zone Desertique
Techtran Corp., Glen Burnie, Md.
R. Henane. Apr 68, 21p NASA-TT-F-11612
Contract NASW-1695
Coll- 21 P Refs Tran- Transl. Into English From Rev. Cors Sante Armees (Paris), V. 4, 1963 P 33-54

Descriptors: *Desert adaptation, *Diets, *Nutritional requirements, Climate, Lipid metabolism, Proteins, Psychological factors, Sweat, Vitamins, Water balance.

For abstract, see STAR 06 12.
N68-22210 HC$3.00 MF$0.65

PATHOMORPHOLOGY OF SOME NUCLEI OF THE HYPOTHALAMUS IN RATS DURING THERMOREGULATORY CHANGES,
Federation of American Societies for Experimental Biology, Bethesda, Md.
V. D. Zharskaya, and E. E. Oksova. 1968, 17p
FASEB-NS-2
Foreign text included. Trans. of Arkhiv Anatomii, Gistologii i Embriologii (USSR) v51 n2 p46-51 1966.

Descriptors: (*Hypothermia, *Thalamus), Pathology, Morphology (Biology), Body temperature, Histology, Nerve cells, Nuclei (Biology), Ribonucleic acids, Histological techniques, USSR.
Identifiers: Translations, Thermoregulation.

Some data on pathomorphological changes in the medial, paraventricular and lateral nuclei of the preoptic area of the hypothalamus in rats which had been subjected to cooling down to the rectal temperature 25, 18 and 15C are presented. The animals were decapitated and the material was fixed after Carnoi. The sections were stained after Nissl and Brachet. At the rectal temperature of 25C no essential morphological alterations in the neurons of the nuclei under study were found. The rectal temperature of 18C produced hyperchromatosis of neurons and a decrease in the RNA amount in individual nerve cells, mainly of the medial and periventricular nuclei. Cooling of the animals down to the rectal temperature of 15C caused a distinct diminishment of RNA and increase of hyperchromic nerve cells in number; neurons of the lateral nuclei were less affected by these temperatures. (Author)
PB-178 050T HC$3.00 MF$0.65

DIFFERENTIATION OF RECIPROCAL AND NONSPECIFIC DESCENDING SYNAPTIC INFLUENCES DURING STIMULATION OF THE RETICULAR FORMATION OF THE BRAIN STEM,
Federation of American Societies for Experimental Biology, Bethesda, Md.
P. H. Kostyuk, and M. M. Preobrazhenskii. 1968, 25p FASEB-NS-6
Foreign text included. Trans. of Fiziologichmyi Zhurnal SSSR v12 n6 p712-9 1966.

Descriptors: (*Nerve cells, Spinal cord), Stimulation, Brain, Thresholds (Physiology), Neuromuscular transmission, Reflexes, Electrophysiology, Inhibition, USSR.
Identifiers: Translations.

A series of investigations was undertaken of synaptic processes in the motoneurons of the spinal cord arising during stimulation of certain points of the brain stem. The use of near-threshold stimuli of short duration ensured maximal localization of the stimulation and made it possible to determine accurately the latent periods and the course of the corresponding synaptic processes. (Author)
PB-178 051T HC$3.00 MF$0.65

QUANTITATIVE CHARACTERISTICS OF ACTION POTENTIALS OF THE SOMA OF THE GIANT NEURONS OF THE MOLLUSK PHANORBIS CORNEUS DURING SPONTANEOUS PHYTHMIC DISCHARGE,
Federation of American Societies for Experimental Biology, Bethesda, Md.
I. S. Mahura. 1968, 22p FASEB-NS-7
Foreign text included. Trans. of Fiziologichnyi Zhurnal SSSR v12 n6 p769-74 1966.

Descriptors: (*Nervous system, *Electrophysiology), (*Mollusca, Nervous system), Nerve cells, Nerve impulses, Electrolytes (Physiology), Electric currents, Polarization, Experimental design, Membranes (Biology), USSR.
Identifiers: Translation.

The main purpose of this investigation was to measure the ionic currents through the soma membrane of the giant unipolar neurons during spontaneous development of action potentials. This type of investigation is essential for the study of the mechanisms of generation of the action potential. (Author)
PB-178 052T HC$3.00 MF$0.65

IMPORTANCE OF PAIRED FUNCTION OF THE HEMISPHERES IN ANALYSIS OF MOVING STIMULI,
Federation of American Societies for Experimental Biology, Bethesda, Md.
V. L. Byanki, and L. A. Artamonova. 1968, 20p
FASEB-NS-41
Foreign text included. Trans. of Zhurnal Vysshei Nervnoi Deyatelnosti (USSR) v17 n2 p280-6 1967.

Descriptors: (*Visual perception, *Brain), Stimulation, Light, Motion, Conditioned reflex, Statistical analysis, USSR.
Identifiers: Translations.

The formation of differentiation of stationary and moving photic stimuli and of the direction of movement of photic stimuli is possible in rats. Division of the corpus callosum disturbs analysis of the movement of photic stimuli for more than 4-6.5 months. Differentiation of moving photic stimuli in rats with division of the corpus callosum is disturbed after temporary functional blocking of the cortex of one hemisphere. (Authroor)
PB-178 053T HC$3.00 MF$0.65

CONDITIONED REFLEXES IN THE BAIKAL PLANARIAN PODOPLANA OLIVACEA K. AFTER INJECTION OF RIBONUCLEASE,
Federation of American Societies for Experimental Biology, Bethesda Md.
N. A. Tushmalova. 1968, 8p FASEB-NS-43
Foreign text included. Trans. of Zhurnal Vysshei Nervnoi Deyatelnosti (USSR) v17 n2 p359-61 1967.

Descriptors: (*Conditioned reflex, *Ribonuclease), Inhibition, Motor reactions, Ribonucleic acids, Nervous system, Worms, USSR.
Identifiers: Translations, Planaria.

It is concluded from the discovery of reversible inhibition of a previously formed motor conditioned component under the influence of ribonuclease, and the depression of spontaneous motor activity in experiments to study the effect of the enzyme on the process of conditioned reflex formation, that RNA participates in the processes regulating the level of cell excitability. The results do not support the hypothesis that RNA is directly related to the processes of formation and maintenance of temporary connections. (Author)
PB-178 054T HC$3.00 MF$0.65

ANALYSIS OF FUNCATIONAL ORGANIZATION OF CONDITIONED AVOIDANCE REFLEXES,
Federation of American Societies for Experimental Biology, Bethesda, Md.
R. L. Gasanova. 1968, 25p FASEB-NS-59
Foreign text included. Trans. of Zhurnal Vysshei Nervnoi Deyatelnosti (USSR) v17 n3 p451-8 1967.

Descriptors: (*Conditioned reflex, Defense mechanisms (Psychology)), Stimulation, Electric currents, Reaction (Psychology), Thresholds (Physiology), Motor reactions, USSR.
Identifiers: Translations.

The object of investigation was the functional structure of temporary connection in avoidance reactions in dogs, namely, lifting the lift foreleg, up to a definite height, first elaborated to electricl stimulation of the right hindleg, and then to a distant conditioned stimulus. Four experimental series with extinction of the reaction were carried out: (1) with elimination of electrical stimulation; (2) in the course of elaboration of a similar reaction of the other leg; (3) extinction with reinforcement, when the elaborated movement did not relieve the dog of the current; (4) extinction of avoidance reaction of the foreleg, induced by direct electrical stimulation of the hindleg. The functional state of the conditioned arc links was tested by another signal stimulus not extinct in the given series. In the first two series, the test stimulus evoked the avoidance reaction, in the third, it evoked the newly elaborated movement and in the fourth, it did not evoke the defensive response. Analysis of the facts and changes in the stimulation threshold has shown that in the course of avoidance reaction elaboration, the signal analyser becomes functionally linked to the motor one predominantly through that part of the cutaneous analyser to which the nociceptive stimulation is addressed. (Author)
PB-178 055T HC$3.00 MF$0.65

6Q. Protective Equipment

EVALUATION OF ONE PIECE WET SUIT.
Coast Guard Baltimore Md Field Testing and Development Center
For primary bibliographic entry see Field 6G.
AD-669 230 HC$3.00 MF$0.65

BEHAVIOURAL PROBLEMS IN AEROSPACE MEDICINE.
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 6S.
AD-669 417 HC$3.00 MF$0.65

PROTECTION OF NAVAL ENGINEER PERSONNEL AGAINST HEAT.
Protection Contre La Chaleur Du Personnel Mecanicien Dans La Marine Nationale
Techtran Corp., Glen Burnie, Md.
A. Bernardini, and P. F. Broussolle. Apr 68, 15p NASA-TT-F-11613
Contract NASW-1695
Coll- 15 P Refs Tran- Transl. Into English From Rev. Corpssante Armees (Paris), V. 6, 1965 P 37-49

Descriptors: *High temperature tests, *Human factors engineering, *Protective clothing, Liquid cooling, Ships, Submarines, Thermal comfort, Ventilation.

For abstract, see STAR 06 12.
N68-22212 HC$3.00 MF$0.65

SAFETY INSTRUMENTATION PACKAGE FINAL REPORT.
Beckman Instruments, Inc., Fullerton, Calif.
31 Oct 66, 36p NASA-CR-92056, FR-2352-101
Contract NAS9-3910

Descriptors: *Bioinstrumentation, *Pressure suits, *Safety devices, *Space simulators, Calibrating, Carbon dioxide, Oxygen, Partial pressure, Sensors.

For abstract, see STAR 06 12.
N68-22326 HC$3.00 MF$0.65

MEASUREMENTS REPORT - THERMAL PROPERTY MEASUREMENTS OF MANNED SPACECRAFT CENTER SPACESUIT MATERIALS.
TRW Systems, Redondo Beach, Calif.
F. J. Turnbow. Apr 68, 17p NASA-CR-92087, TRW-68-3346.11JA-31
Contract NAS9-3670

Descriptors: *Lexan (trademark), *Material absorption, *Thermal radiation, Reflectance, Space suits, Teflon (trademark).

For abstract, see STAR 06 12.
N68-22779 HC$3.00 MF$0.65

6R. Radiobiology

FOLIAR UPTAKE AND TRANSLOCATION OF 22Na-LABELLED MONODISPERSE GLYCEROL AEROSOL PARTICLES (0.6 MICRON),
Naval Radiological Defense Lab San Francisco Calif
George S. Dehnel, Burton E. Vaughan, and William J. Vaughan. 3 Jun 68, 27p Rept no. USNRDL-TR-68-40

Descriptors: (*Plants (Botany), Radiological contamination), Radioactivity, Radioactive fallout, Simulation, Tracer studies, Radioactive isotopes, Aerosols, Transport properties, Radiobiology, Labeled substances, Humidity, Diurnal variations, Absorption (Biological), Radiation effects, Metabolic diseases.

Uptake and translocation of 22Na were determined after labelled aerosol deposition on primary leaves of the 12-14 day old string bean plant, Phaseolus vulgaris var. green pod Landreth. Plants were grown under standardized humidity and light conditions, and following the aerosol exposure they were maintained for a subsequent 24 hour period under one of the following lighting conditions: continuous light, cyclic light, continuous dark. In the last two groups, humidity also was varied systematically. Labelled aerosol was produced as a monodisperse particle by a modified version of the Sinclair-LaMer glycerol generator. Leaf absorption was determined as the radioactivity remaining in the leaf after 6 seconds elution in iso-osmotic mannitol solution (0.36 M). With this elution procedure about 20 percent of the isotope remained fixed in the leaf--a fraction removable only very slowly by continued elution. Compared to light, dark conditions caused nearly total cessation of radioactivity transport to stem and to root. Leaf radioactivity did not change appreciably in dark. Lowered humidity had inhibitory effect on leaf absorption and on normal transport to stem and root maintained photosynthetically. Aerosol exposure caused disturbance of normal leaf metabolism, judged by polarographic assays in sections of exposed leaves which had recuperated from sectioning injury. At atypically high levels of glycerol deposition (18 micrograms/sq cm leaf) O2 uptake was inhibited as well as O2 evolution. However, at the lower levels (e.g. 6 micrograms/sq cm leaf) only O2 evolution was inhibited, showing about half of maximal O2 evolution rates characteristic of this plant. (Author)
AD-669 265 HC$3.00 MF$0.65

STUDIES OF THE NAVAL FACILITIES ENGINEERING COMMAND PROTECTIVE SHELTER. II. SUMMER TRIALS.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 13M.
AD-669 448 HC$3.00 MF$0.65

PUBLIC HEALTH ASPECTS OF GALACTIC RADIATION EXPOSURE IN SUPERSONIC TRANSPORT,
Naval Aerospace Medical Inst Pensacola Fla
For primary bibliographic entry see Field 1C.
AD-669 451 HC$3.00 MF$0.65

CO2 LASER INDUCED SKIN LESIONS.
Army Medical Research Lab Fort Knox Ky
For primary bibliographic entry see Field 6E.
AD-669 610 HC$3.00 MF$0.65

DOSE-EFFECT MODIFYING FACTORS IN RADIATION PROTECTION.
Brookhaven National Lab., Upton, N. Y.
Aug 67, 34p
Report of Subcommittee M-4 (Relative Biological Effectiveness) of the National Commission on Radiation Protection.

Descriptors: (*Radiological dosage, Protection), Dose rate, Effectiveness, Radiological contamination, Exposure, Radioactive fallout, Penetration, Neutrons, Mammals, Survival.

For abstract, see NSA 22 10.
BNL-50073 HC$3.00 MF$0.65

EVALUATION OF RADIOLOGICAL CONDITIONS IN THE VICINITY OF HANFORD, JANUARY-JUNE 1967,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
T. H. Essig. Jan 68, 23p
Contract AT (45-1)-1830

Descriptors: (*Radiological contamination, Washington (State)), Radioactive fallout, Dose rate, Radioactive waste, Population, Radiation hazards, Water, Shellfish, Atmosphere, Environmental

tests, Rivers, Food, Periodic variations, Radioactivity, Monitors, Radiation measurement systems.

For abstract, see NSA 22 10.
BNWL-665 HC$3.00 MF$0.65

EFFECT OF HIGH-ENERGY RADIATION OF CERAMIC DIELECTRICS,
Joint Publications Research Service, Washington, D. C.
N. S. Kostyukov, and T. M. Smirnova. 25 Jan 68, 12p
Trans. of mono. Trudy Gosudarstvennogo Issledovatelskogo Elektrokeramicheskogo Institute, Moscow, 4 Nov 1960 p120-7.

Descriptors: (*Radiation effects, Ceramic materials), Dielectrics, Photonuclear reactions, Titanium compounds, Oxygen, Zirconium alloys, Physical properties, Cobalt, Polarization, Reactor lattice parameters.

In a recent paper the effect of high-energy gamma-radiation on the dielectric properties of ceramic materials was considered. The irradiation was carried out with gamma-quanta with an energy of 1.3 Mev, for which the most probable mechanism of interaction of the gamma-rays with the substance is the compton effect, and with energies of 30-260 Mev, for which photonuclear reactions are most probable. The following were subjected to testing: e electrical porcelain of compound M-23, capacitor material, based on titanium dioxide, of compound M-75, barium titanate, and high-frequency steatite (compounds TK-21, SK-1, and S-61). The chemical compositions of these materials with respect to oxides (in per cent) are given in Table 1. In the same table the possible photonuclear reactions of the component elements, known from (1), ARE GIVEN. (Author)
JPRS-44148 HC$3.00 MF$0.65

VIRUSES ISOLATED FROM BEAGLE DOGS EXPOSED TO AEROSOLS OF 90 Sr AND 144 Ce.
Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex. Dept. of Microbiology.
For primary bibliographic entry see Field 6M.
For abstract, see NSA 22 10.
LF-36 HC$3.00 MF$0.65

CHARACTERISTICS OF NEUTRONS AND NEUTRON SOURCES WITH REGARD TO BIOLOGICAL APPLICATIONS.
Naval Scientific Technical Information Center, London (England).
Y. Van Der Feer. 1967, 16p NSTIC-TRANS-1840
Tran- Transl. Into English From Atoomenergie Haar Toepassingen (Rotterdam), Jun. 1966 P 122-129

Descriptors: *Biological effects, *Neutron irradiation, *Neutron sources, *Radiation medicine, Nuclear radiation, Nuclear research and test reactors, Particle accelerators, Radiation dosage, Radiation effects.

For abstract, see STAR 06 12.
N68-22443 HC$3.00 MF$0.65

RADIOBIOLOGICAL STUDY OF THE RADIOPROTECTIVE ACTIVITY OF A NATURAL IRANIAN PRODUCT - " SHIR- KHECHT".
Etude Radiobiologique de Lactivite Radioprotectrice D Un Compose Naturel Iranien - " Shir-Khecht"
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France).
N. Rouhanizadeh. 31 Jan 68, 86p CEA-R-3412
Lang- in French

Descriptors: *Antiradiation drugs, *Radiation protection, *Radiobiology, Irradiation, Radiation injuries, Radiochemistry, Radiopathology, Rats.

For abstract, see STAR 06 12.
N68-22700 HC$3.00 MF$0.65

STUDY OF RADIATION HAZARDS TO MAN ON EXTENDED MISSIONS.
Boeing Co., Seattle, Wash.
S. B. Curtis, and M. C. Wilkinson. May 68, 89p NASA-CR-1037
Contract NASW-1362
Coll- 89 P Refs

Descriptors: *Galactic radiation, *Manned space flight, *Radiation hazards, *Solar radiation, Cosmic rays, Energy spectra, Radiation dosage, Radiation shielding, Radiobiology, Thickness.

For abstract, see STAR 06 12.
N68-22849 HC$3.00 MF$0.65

ESTIMATION OF RADIATION DOSES FOLLOWING A REACTOR ACCIDENT,
Oak Ridge National Lab., Tenn.
F. T. Binford, J. Barish, and F. B. K. Kam. Feb 68, 41p
Contract W-7405-eng-26

Descriptors: (*Radiological dosage, Reactor accidents), Radioactive isotopes, Radioactive decay, Helium group gases, Iodine.
Identifiers: Plume computer program, Computer analysis.

For abstract, see NSA 22 10.
ORNL-4086 HC$3.00 MF$0.65

THE OAK RIDGE RESEARCH REACTOR SAFETY ANALYSIS,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18M.
For abstract, see NSA 22 10.
ORNL-4169-Vol-2 HC$3.00 MF$0.65

6S. Stress Physiology

VISION RESEARCH: FLYING AND SPACE TRAVEL,
National Academy of Sciences - National Research Council Washington D C
Milton A. Whitcomb, and William Benson. 1968, 203p*
Contract Nonr-2300 (05)
Proceedings of Spring Meeting on Vision, Washington, D. C., 1964.

Descriptors: (*Vision, *Space medicine), (*Aviation medicine, Vision), Light, Stimulation, Illumination, Rendezvous spacecraft, Space simulation chambers, Performance (Human), Astronauts, Pilots, Visual acuity, Flashblindness, Radiation injuries, Training devices, Lunar environment, Guidance, Space navigation, Low altitude, Detection.

Contents: Vision in space travel--Criteria for laboratory experiments useful in field situations; Visual fitness for space travel; The effect of flash distribution and illuminance-level upon the detection of low intensity light stimuli; Langley Research Center simulators and studies related to space rendezvous and docking; Some Langley Research Center plans in the area of visual displays for lunar mission simulation; Visual masking using different test-stimulus patterns; Sextant sighting performance in the Ames midcourse navigation and guidance simulator; Comments on Major Gordon Cooper's observations from orbit; Gemini in-flight visual-acuity experiment. Flash blindness--Operational significance of the flash blindness problem; The nature of radiation from nuclear weapons in relation to flash blindness; Experimental investigations of the flash blindness problem; Methods of preventing flash blindness; Air Force efforts in the field of flash blindness; A flash blindness indoctrination and training device. Vision problems in low-altitude, high-speed flight--Geographic orientation during low-altitude flight; Dynamic visual detection recognition; Operational problems associated with low-altitude flight; Some operational aspects of visual problems in low-flying, high-speed aircraft.
AD-669 266 HC$3.00 MF$0.65

ENDOCRINE-METABOLIC EFFECTS OF UNUSUALLY LONG OR FREQUENT FLYING MISSIONS IN C-130E OR C-135B AIRCRAFT.
Final rept. Nov 64-Dec 67,
School of Aerospace Medicine Brooks AFB Tex
Henry B. Hale, Clarence A. Anderson, Edgar W. Williams, and Emanuel Tanne. Mar 68, 23p Rept no. SAM-TR-68-24

Descriptors: (*Pilots, Stress (Psychology)), Excretion, Responses, Metabolism, Corticosteroid agents, Amines, Epinephrine, Urea, Uric acid, Phosphorus, Magnesium, Sodium, Potassium, Adrenal glands, Sensitivity, Adaptation (Physiology), Urine, Sleep, Recovery, Fatigue (Physiology), Jet transport planes.
Identifiers: C-135 aircraft, C-135B aircraft, C-130 aircraft, C-130E aircraft.

Flight-stress appraisal was made by means of a battery of urinary determinations (epinephrine, norepinephrine, 17-OHCS, urea, uric acid, phosphorus, magnesium, sodium, and potassium) for flyers who participated in (a) 20-hour missions in C-130E aircraft (flights from New Zealand to Antarctica, and back), (b) 6-day missions in C-135B aircraft (earth-circling missions), or (c) 7-week missions in C-135B aircraft (over-frequent transoceanic and transcontinental flying). The adrenal medulla (as judged by urinary epinephrine) consistently showed flight-sensitivity, but other endocrine-metabolic functions varied in ways indicative of adaptation. With flight circumstances standardized (particularly with respect to time of day), flight effects tended to be reproducible. With crew rest limited to 2 days, recovery from flight-stress tended to be incomplete. Sleep deprivation and crew position were shown to be factors which modify flight-stress reactions. Eastbound and westbound earth-circling missions did not induce different degrees of flight-stress, as judged by these endocrine-metabolic indices. (Author)
AD-669 346 HC$3.00 MF$0.65

RESPONSES OF ANIMALS TO OXYGEN AT REDUCED PRESSURE.
Aerojet-General Corp Dayton Ohio
For primary bibliographic entry see Field 6T.
AD-669 351 HC$3.00 MF$0.65

MAN'S TOLERANCE TO TRACE CONTAMINANTS,
Aerospace Medical Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 3B.
AD-669 356 HC$3.00 MF$0.65

INVESTIGATION OF THE EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE WITH A NASA PROTOTYPE APOLLO HELMET.
Final rept. Dec 65-Mar 66,
Aerospace Medical Research Labs Wright-Patterson AFB Ohio
Richard W. Shoenberger. Feb 68, 21p Rept no. AMRL-TR-67-205

Descriptors: (*Space environmental conditions, Stress (Physiology)), (*Control panels, *Reading), Helmets, Protective mask facepieces, Vibration, Acceleration, Visual acuity, Correlation techniques, Experimental data, Intensity, Performance (Human), Deterioration, Space medicine.

Dial reading performance while wearing a NASA prototype Apollo helmet was investigated during short duration whole-body sinusoidal vibration. The subjects were in the semisupine position so

that the force of gravity acted through the X-axis of the body, with the vibration acting in the X-axis in one experiment and in the Y-axis in another. In each study, dial reading was assessed (subject and dial vibrating) at 6, 11, and 15 Hz when the helmet was worn either with or without a helmet liner. The vibration intensity was plus or minus 1.2 G in the X-axis experiment and plus or minus 0.9 G in the Y-axis experiment. Static control measurements were also made both with and without the helmet. The results showed significant decrements in dial reading performance during vibration which were differentially related to direction of vibration, frequency of vibration, and to combinations of liner versus no liner with the three frequencies. The results further indicated that the effects of different directions and frequencies of vibration while wearing the Apollo helmet were quite similar to those found in previous studies under the same conditions using a Mercury helmet without a face plate. However, the data suggested that performance was somewhat poorer during both vibration and static conditions while wearing the prototype Apollo helmet. This is probably the result of visual interference produced by the curvature of the helmet face plate and by small scratches and blemishes on the face plate of the particular helmet used in this study. (Author)
AD-669 357 HC$3.00 MF$0.65

BEHAVIOURAL PROBLEMS IN AEROSPACE MEDICINE.
Advisory Group for Aerospace Research and Development Paris (France)
Oct 67, 430p Rept no. AGARD-CP-25
NATO Furnished. Presented at the Meeting of the Aerospace Medical Panel of AGARD (24th), held in Rhode-Saint-Genese, Belgium, 25-27 Oct 67.

Descriptors: (*Space medicine, *Reports), Symposia, Behavior, Diurnal variations, Attention, Sleep, Drugs, Biochemistry, Aerial warfare, Performance (Human), Cosmic rays, Radiation effects, Lunar environment, Protective clothing, Flight crews, Selection, Flashblindness, High altitude, Lungs.

The 24th Meeting of the AGARD Aerospace Medical Panel, which was held from 25th to 27th October, 1967, dealt essentially with behavioural problems of aerospace medicine, with particular reference to such aspects as diurnal rhythms, sleep and alertness. Recent medical problems of space and of air warfare were also considered. It was particularly in the section on human factors in air weapons systems that the subject of sleep and wakefulness, based on a twenty-four hour cycle, was considered in relation to man's performance. Emphasis was placed on the practical aspect of these circadian problems, particularly in relation to associated changes in reaction time and mental performance, and in relation to civil and military flying. The quality of sleep, and the biochemistry underlying the choice of sleep-inducing drugs, formed part of this programme of communications. Other subjects, such as quantifying biological effects of cosmic radiation, and the ability to walk in a lunar environment, as tested by the Langley sub-gravity simulator, formed part of the section dealing with current problems of space, while the communications in the remainder of the meeting drew attention to a variety of other topics, many of which were orientated towards a specialist audience. (Author)
AD-669 417 HC$3.00 MF$0.65

STUDIES OF THE NAVAL FACILITIES ENGINEERING COMMAND PROTECTIVE SHELTER. II. SUMMER TRIALS.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 13M.
AD-669 448 HC$3.00 MF$0.65

CRIMEAN UNDERWATER SCUBA PROJECT,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 5I.
JPRS-44179 HC$3.00 MF$0.65

RELATIVE ROLES OF GRAVITATIONAL AND INERTIAL WORK IN THE ENERGY COST OF HUMAN LOCOMOTION.
California Univ., San Francisco. Medical Center.
L. Lukin, and H. J. Ralston. Apr 68, 18p NASA-CR-1042
Grant NSG-722
Coll- 18 P Refs

Descriptors: *Human body, *Metabolism, *Walking, Gravitational effects, Human factors laboratories, Kinetic energy, Loads (forces), Physical work, Work capacity.

For abstract, see STAR 06 12.
N68-21859 HC$3.00 MF$0.65

AEROSPACE MEDICINE AND BIOLOGY - A CUMULATIVE INDEX.
National Aeronautics and Space Administration, Washington, D. C.
Jan 68, 887p NASA-SP-7011/46/, NASA-SP-7011/45/

Descriptors: *Aerospace medicine, *Bibliographies, *Bioastronautics, *Indexes (documentation), Biological effects, Classifications, Information retrieval, Medical science, Nasa programs, Reference systems.

For abstract, see STAR 06 12.
N68-22194 HC$3.00 MF$0.65

AN EVALUATION OF INTERMITTENTLY INFLATED EXTREMITY CUFFS IN PREVENTING THE CARDIOVASCULAR DECONDITIONING OF BEDREST AND WATER IMMERSION.
Texas Inst. for Rehabilitation and Research, Houston.
F. B. Vogt. Apr 67, 120p NASA-CR-92085
Contracts NAS9-5821, NIH FR-00254

Descriptors: *Bed rest, *Cardiovascular system, *Human tolerances, *Physiological effects, *Submerged bodies, *Tourniquets, Aerospace medicine, Human body, Inflatable structures, Water treatment.

For abstract, see STAR 06 12.
N68-22529 HC$3.00 MF$0.65

DIAGNOSTIC CRITERIA FOR GRADING THE SEVERITY OF ACUTE MOTION SICKNESS.
Naval School of Aviation Medicine, Pensacola, Fla.
D. B. Cramer, A. Graybiel, E. F. Miller, II, and C. D. Wood. Feb 68, 14p NASA-CR-94398, NAMI-1030
NASA ORDER R-93
Coll- 14 P Refs

Descriptors: *Criteria, *Diagnosis, *Motion sickness, Clinical medicine, Symptomology.

For abstract, see STAR 06 12.
N68-22850 HC$3.00 MF$0.65

AEROSPACE MEDICINE AND BIOLOGY. A CONTINUING BIBLIOGRAPHY WITH INDEXES.
National Aeronautics and Space Administration, Washington, D. C.
Apr 68, 144p NASA-SP-7011/49/

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Indexes (documentation), Abstracts, Aerospace environments, Physiological effects, Psychological effects.

For abstract, see STAR 06 12.
N68-22882 HC$3.00 MF$0.65

6T. Toxicology

RESPONSES OF ANIMALS TO OXYGEN AT REDUCED PRESSURE.
Final rept. May 65-May 66,
Aerojet-General Corp Dayton Ohio
J. D. MacEwen, R. P. Geckler, and K. C. Back.
Feb 68, 36p Rept no. AGC-3266
AMRL-TR-67-78
Contract AF 33 (657)-11305

Descriptors: (*Oxygen, Toxicity), Respiration, Laboratory animals, Space simulation chambers, Experimental data, Blood analysis, Blood cells, Tissues (Biology), Microscopy, Diseases, Respiratory system, Liver, Kidneys, Space medicine.
Identifiers: Congestion.

As extensions of previous short-term experiments on the toxicity of oxygen at reduced pressure in animals, long-term continuous exposures of beagle dogs, rhesus monkeys and albino rats and mice were undertaken. The exposures were for 230 days to 100% oxygen at 5 psia. No mortality occurred in the exposed dogs or monkeys. More rats and mice died in the control groups than in the experimental groups, indicating no effects on mortality due to the experimental conditions. The growth rates of control and experimental rats were almost identical, further indicating lack of deleterious effects. Histopathologic examination of tissues was conducted on all four animal species. No differences were observed between exposed animals and their controls in monkeys, rats or mice. Minimal differences consisting of mild bronchitis and mild congestion were seen in the dogs exposed to 100% oxygen at reduced pressure. One exposed dog exhibited severe pulmonary changes associated with acute interstitial bronchial pneumonia. Periodic measurements of blood constituents showed no significant differences attributable to prolonged oxygen exposure at reduced pressure. (Author)
AD-669 351 HC$3.00 MF$0.65

MAN'S TOLERANCE TO TRACE CONTAMINANTS,
Aerospace Medical Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 3B.
AD-669 356 HC$3.00 MF$0.65

EXPERIMENT OF DAMAGE CONTROL MATERIALS AND METHODS FOR FLEET HANDLING OF PACKAGED LIQUID PROPELLANTS.
Allied Chemical Corp Morristown N J Industrial Chemicals Div
For primary bibliographic entry see Field 21I.
AD-669 437 HC$3.00 MF$0.65

BIOLOGICAL EFFECTS OF RARE, DISPERSED AND OTHER METALS AND THEIR COMPOUNDS USED IN INDUSTRY.
National Research Council of Canada, Ottawa (Ontario).
S. E. Sandratskaya. 1967, 15p NRC-TT-1283
Tran- Transl. Into English From Toksikol. Redkikh Metallov Medgiz (Moscow), 1963 P 117-135

Descriptors: *Biological effects, *Physiological effects, *Tellurium, *Toxicity, Chemical analysis, Chemical properties, Industrial safety, Toxic hazards.

For abstract, see STAR 06 12.
N68-22476 HC$3.00 MF$0.65

7. CHEMISTRY

7A. Chemical Engineering

SYNTHESIS AND PROPERTIES OF TETRAPOLYETHER ELASTOMERS,
Rock Island Arsenal Ill

For primary bibliographic entry see Field 11J.
AD-669 479 Not available from CFSTI.

NEW POLYMERIC MATERIALS IN ANTICORROSION TECHNOLOGY (NOVYE POLIMERNYE MATERIALY V ANTIKORROZIONNOI TEKHNIKE),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11I.
AD-669 518 HC$3.00 MF$0.65

CATALYTIC PROPERTIES OF SEMICONDUCTORS.
Final rept.,
Massachusetts Inst of Tech Cambridge Dept of Chemical Engineering
Raymond F. Baddour, and Charles W. Selvidge.
1 Mar 68, 23p*
Contract Nonr-3963 (04)

Descriptors: (*Semiconductors, *Catalysts), Silicon, Germanium, Surfaces, Test equipment, Ethanols, Formic acids.
Identifiers: Reactors (Chemical).

The design of a high vacuum flow reactor for investigating the catalytic activity and surface chemical composition of clean surfaces is described. Results obtained applying such a system to the study of the interaction between clean silicon and germanium surfaces and ethanol and formic acid vapors are reported. (Author)
AD-669 691 HC$3.00 MF$0.65

INDEXED BIBLIOGRAPHY OF NUCLEAR DESALINATION LITERATURE-1.
Oak Ridge National Lab., Tenn.
Mar 68, 61p*
Contract W-7405-eng-26

Descriptors: (*Desalination, Bibliographies), Nuclear reactors, Nuclear power plants, Abstracts.

For abstract, see NSA 22 10.
ORNL-NDIC-3 HC$3.00 MF$0.65

PREPARATION OF CONCENTRATED PHOSPHATE FERTILIZERS BY DISTILLATION OF NITRIC ACID EXTRACTS,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 2A.
PB-178 093T HC$3.00 MF$0.65

THE USE OF A HIGH-FREQUENCY ELECTRODELESS PLASMATRON FOR THE PRODUCTION OF PURE SILICON AND SILICON OXIDES,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
F. B. Vurzel, N. N. Dolgopolov, A. I. Maksimov, L. S. Polak, and V. I. Fridman. 2 Aug 66, 12p TVA-4198
Trans. of mono. Kinetika i Termodinam. Khim. Reaktsii v Nizkotemperaturnoi Plazme, n.p., 1965 p223-32, tr. by Carol C. Parr.

Descriptors: (*Plasma generators, Chemical reactions), (*Silicon compounds, Synthesis (Chemistry)), Discharge tubes, High frequency, Plasma medium, Temperature, Semiconducting films, Silicon, Silicon carbides, Powders, Monoxides, Silicon dioxide, USSR.
Identifiers: Plasmatrons, Silicon monoxide.

A study was of processes for obtaining silicon and silicon carbide films with semiconductor properties and also powders of silicon monoxide and finely dispersed silicon dioxide with an electrodeless plasmatron.
PB-178 094T HC$3.00 MF$0.65

THE USE OF NATURAL GAS FOR THE REDUCTION OF PHOSPHORITES IN THE PRODUCTION OF ELEMENTAL PHOSPHORUS,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
N. N. Postnikov. 13 Feb 67, 7p TVA-4222
Trans. of Khimicheskaya Promys' lennost (USSR) n1 p62-4 1964, tr. by Carol C. Parr.

Descriptors: (*Phosphorus, Production), Phosphates, Reduction (Chemistry), Calcium compounds, Hydrocarbons, USSR.
Identifiers: Natural gas.

It was found that there are no practical prospects for using natural gas for reducing phosphates with the purpose of producing phosphorus of phosphoric acid.
PB-178 096T HC$3.00 MF$0.65

STATIC CHARACTERISTICS OF THE PRODUCTION OF 100% SO2,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
L. S. Gordeev, and B. A. Chertkov. 25 Aug 67, 7p TVA-P-4259
Trans. of Khimicheskaya Promyshlennost (USSR) v43 n2 p129-31 1967, tr. by William Hunn.

Descriptors: (*Sulfur compounds, Industrial production), Dioxides, Ammonium compounds, Sulfites, Separation, Distillation, Optimization, USSR.
Identifiers: Sulfur dioxide, Ammonium bisulfite.

A study was made of the static characteristics of the process of separating sulfur dioxide from ammonium bisulfite in an effort to optimize the process.
PB-178 101T HC$3.00 MF$0.65

ABSORPTION OF SULFUR DIOXIDE BY AMMONIUM SULFITE-BISULFITE SOLUTION IN A SPRAY-TYPE VENTURI SCRUBBER,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
B. P. Volgin, T. F. Efimova, and M. S. Gofman. 15 Sep 67, 13p TVA-P-4260
Trans. of Khimicheskaya Promyshlennost (USSR) v43 n2 p132-6 1967, tr. by William Hunn.

Descriptors: (*Sulfur compounds, Industrial production), Dioxides, Ammonium compounds, Sulfites, Absorption, Industrial equipment, USSR.
Identifiers: Sulfur dioxide, Ammonium bisulfite, Ammonium sulfite.

Experimental data are presented which indicate that multistage absorption in Venturi scrubbers makes them competitive with packed column and bubble absorbers in resistance and electric energy consumption. Capital expenditures for equipping are lowered by a factor of 2.5 to 3.0 and expenditures for the building (the overall dimensions of the Venturi scrubbers are relatively small) are 1.5 to 2 times lower.
PB-178 102T HC$3.00 MF$0.65

KINETICS OF STRIPPING SO2 FROM SOLUTIONS OF AMMONIUM SULFITE-BISULFITE IN PACKED COLUMNS,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
B. A. Chertkov. 1966, 12p TVA-P-4269
Trans. of Khimicheskaya Promyshlennost (USSR) v42 n9 p685-9 1966, tr. by William C. Hunn.

Descriptors: (*Sulfur compounds, Industrial production), Dioxides, Ammonium compounds, Sulfites, Separation, Hydrodynamics, Industrial equipment, Optimization, USSR.
Identifiers: Sulfur dioxide, Ammonium bisulfite, Ammonium sulfites, Reactors (Chemical).

It was found that for effective separation of SO2 from solution, the hydrodynamic conditions of performance of a column packed with 50 x 50 mm rings should be selected such that solution retention time in the 'hot' zone should comprise 2-3 minutes.
PB-178 103T HC$3.00 MF$0.65

AMMONIUM BISULFITE AS A SOURCE OF 100%-SO2 PRODUCTION,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
B. A. Chertkov. 13 Feb 68, 14p TVA-P-4277
Trans of Khimicheskaya Promyshlennost (USSR) n1 p44 1964, tr. by William C. Hunn.

Descriptors: (*Sulfur compounds, Industrial production), Dioxides, Ammonium compounds, Sulfites, Hydrolysis, Chemical equilibrium, Temperature, Separation, USSR.
Identifiers: Sulfur dioxide, Ammonium bisulfite.

The effect of temperature (within the limits of 25-100C) was observed on the course of equilibrium hydrolytic reactions which serve as the basis of the process for producing 100% SO2 from ammonium bisulfite solutions. The optimum conditions for conducting the process are shown while taking into consideration the change of equilibrium pressures of SO3 and NH3 with a change in solution composition. It is shown that the maximum SO2 separation from concentrated ammonium bisulfite solutions can be 140 kg SO2 per cu m solution; the theoretical steam consumption specifically for stripping will be equal to 1 ton per ton SO2 therewith. (Author)
PB-178 104T HC$3.00 MF$0.65

PRODUCTION OF 100% SO2 FOR SODIUM HYDROSULFITE MANUFACTURING,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
B. A. Chertkov, B. T. Vasilev, T. G. Repenkova, R. I. Boguslavskaya, and N. S. Dobromyslova.
2 Feb 68, 7p TVA-P-4278
Trans. of Khimicheskaya Promyshlennost (USSR) n1 p49-52 1964, tr. by William C. Hunn.

Descriptors: (*Sulfur compounds, Industrial production), Dioxides, Ammonium compounds, Sulfites, Hydrolysis, Sodium compounds, Separation, USSR.
Identifiers: Sulfur dioxide, Ammonium bisulfite, Sodium hydrosulfite.

A means was realized for producing 100% SO2 with the use of ammonium bisulfite in the capacity of sulfur; the ammonium bisulfite is produced on the basis of off-gases of a contact plant. The ammonium bisulfite is exposed to hydrolytic decomposition by water steam in a column under a low vacuum. A comparison of the process parameters and economic indicators of the production of 100% SO2 by this method and by the sero-oleum process has shown that the cost of one tone of 100% SO2 by the new method is 28% lower and the electric power consumption is three times less.
PB-178 105T HC$3.00 MF$0.65

NATURAL-GAS CATALYTIC REDUCTION OF NITRIC OXIDE TAIL GASES FROM NITRIC ACID PRODUCTION,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
A. D. Tikhonenko, and M. N. Nabiev. 12 Mar 68, 4p TVA-P-4282
Trans. of Uzbekskii Khimicheskii Zhurnal (USSR) v11 n4 p6-9 1967, tr. by William C. Hunn.

Descriptors: (*Nitrogen oxides, Reduction (Chemistry)), Nitric acid, Industrial production, Waste gases, Recovery, Catalysts, Hydrocarbons, Methane, Nickel alloys, Chromium alloys, Foils, Thermal stability, USSR.
Identifiers: Natural gas.

Tests were conducted on natural-gas catalytic reduction of tail-gas nitric oxides from nitric acid production; they took place at atmospheric pressure in a combined installation. In operation over 710 hrs the nickel-chromium foil showed sufficient thermal stability under conditions assuring complete purification of the gas; catalyst activity significantly decreased and was reduced with H2 at 320C. The conditions for complete nitric oxide reduction were found and also those for achieving

the sanitary norm of NO+NO2 content (0.02%). In a two-layer catalyst it was possible to decrease the temperature of the gas entering the catalyzer to 450C; thereupon CH4:O2 = 0.8. (Author)
PB-178 106T HC$3.00 MF$0.65

COMPLEX PROCESSING OF COMMON SALT. III. DECOMPOSITION OF APATITE CONCENTRATE BY AMMONIUM BISULFATE,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
S. S. Karakhanyan, G. O. Grigoryan, and I. M.Makhtesyan. 21 Mar 68, 7p TVA-P-4293
Trans. of Akademiya Nauk Armyanskoi SSR, Erevan. Izvestiya. Khimicheskikie Nauki, v18 n5 p516-20 1965, tr. by William C. Hunn.

Descriptors: (*Fertilizers, Industrial production), (*Phosphates, Processing), Calcium compounds, Decomposition, Ammonium compounds, Sulfites, Sodium chloride, Sulfuric acid, USSR.
Identifiers: Apatites, Ammonium bisulfite.

A study was made of the decomposition of apatite concentrate by bisulfate at various experimental temperatures; E. G., NH4HSO4 concentrations, H2SO4 standards (on an NH4HSO4 scale) and duration of slurry residence in the reactor. It was established that the optimum conditions for complete decomposition are: temperature = 95C; NH4HSO4 concentration = 60%; intermixing time = 120 minutes; quantity of NH4HSO4 for decomposing 100 parts by weight apatite concentrate = 164 parts by weight (on an H2SO4 scale). The feasibility of producing a complex, double-component, nitrogen-phosphorus fertilizer was demonstrated in which the content of plant nutrients totals 22.35%, of which P2O5 = 13.9% and N2 = 8.45%. (Author)
PB-178 107T HC$3.00 MF$0.65

THE COMPLEX TREATMENT OF COMMON SALT. IV. THE DECOMPOSITION OF APATITE CONCENTRATE BY A MIXTURE OF AMMONIUM SULFATE-BISULFATE AND THE CHEMICAL MECHANISM OF THE PROCESS,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
S. S. Karakhanyan, and G. O. Grigoryan. 2 Apr 68, 9p TVA-P-4294
Trans. of Akademiya Nauk Armyanskoi SSR, Erevan. Izvestiya. Khimicheskikie Nauki, v18 n5 p521-8 1965, tr. by William C. Hunn.

Descriptors: (*Fertilizers, Industrial production), (*Phosphates, Processing), Calcium compounds, Decomposition, Ammonium compounds, Sulfites, Sodium chloride, Sulfuric acid, USSR.
Identifiers: Apatites, Ammonium bisulfite, Ammonium sulfite.

A study was made of the decomposition of apatite concentrate by a mixture of ammonium sulfate-bisulfate with the molar ratio of M NH3/SO4 (2-) = 1.33 at various experimental temperatures, ammonium bisulfate concentrations, and acidity standards. It was established that for the process of decomposition of apatite concentrate by a mixture of ammonium sulfate-bisulfate the optimum conditions are: temperature = 90C, concentration of sulfate-bisulfate mixture = 50-55%, intermixing time = 60 min. A possibility of obtaining complex nitrogen-phosphorus fertilizer with the ratio of N:P = 1.1 was demonstrated. On the basis of optical studies, theoretical calculations, and specific experiments it was shown that with a full acidity standard all the available phosphoric and hydride occurs in the form of monoammonium phosphate. It was shown that the reduction in the acidity standard during decomposition of apatite concentrate by a mixture of ammonium sulfate-bisulfate is explained by the formation of diammonium phosphate resulting from the double decomposition reactions between the decomposition of the dicalcium phosphate formed in the process and ammonium sulfate. (Author)
PB-178 108T HC$3.00 MF$0.65

CATALYTIC ACTIVITY OF PLATINIZED NICKEL IN RELATION TO OXIDATION OF SO2,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7D.
PB-178 110T HC$3.00 MF$0.65

7B. Inorganic Chemistry

ABSORPTION BY CO2 BETWEEN 3100 AND 4100 cm-1 (2.44-3.22 MICRONS).
Philco-Ford Corp Newport Beach Calif Aeronutronic Div
For primary bibliographic entry see Field 20F.
AD-669 468 HC$3.00 MF$0.65

RAMAN SPECTRA OF POLYCRYSTALLINE H2S AND D2S.
Michigan State Univ East Lansing
For primary bibliographic entry see Field 7D.
AD-669 501 HC$3.00 MF$0.65

POLY (TRIS (DIALKYLPHOSPHINATO) ALANES); (NOVEL TRIS (PHOSPHINATES) OF ALUMINUM).
Technical rept.,
Dow Chemical Co Midland Mich
Edward E. Flagg, and Donald L. Schmidt. 16 May 68, 8p Rept no. TR-4
Contract Nonr-4968 (00)
Availability: Prepared for publication in Journal of the American Chemical Society.

Descriptors: (*Aluminum compounds, *Inorganic polymers), (*Phosphorus compounds, Inorganic polymers), Phosphines, Metalorganic compounds, Molecular weight, Viscosity, Films, Spectra (Infrared), Chemical bonds.
Identifiers: Poly (phosphinato alanes), Alanes.

Two novel poly (tris (dialkyl phosphinato) alanes), ((R (R)PO2)2 Al (O2PR2))n, (R=C4H9, C6H5CH2, C8H17 or C7H15), are described. The polymers have high molecular weights (n=270 to 1090) and high intrinsic viscosities (37 dl/g for R=C8H17) in tetrahydrofuran. The nonsolvated polymers form clear, semi-flexible, and hydrolytically stable films. Infrared, viscosity, and molecular weight data are consistent with tris (phosphinato) triple bridges between 6-coordinate octahedral aluminum (III) ions. (Author)
AD-669 644 Not available from CFSTI.

DETERMINATION OF MICROGRAM QUANTITIES OF FLUORIDE IN METAL OXIDES,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 22 10.
BNWL-601 HC$3.00 MF$0.65

KINETIC STUDY OF THE REDUCTION OF NbCl5 BY NIOBIUM METAL USING A GAS CHROMATOGRAPH.
Ames Lab., Iowa.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 22 10.
IS-1780 HC$3.00 MF$0.65

PEROXIDES OF THE ALKALINE EARTHS.
Uber Die Peroxyde Der Erdalkalien
Techtran Corp., Glen Burnie, Md.
W. Nottebohm, and E. H. Riesenfeld. Apr 68, 10p NASA-TT-F-11641
Contract NASW-1695
Coll- 10 P Refs Tran- Transl. Into English From Z. Anorg. Allgem. Chem. (Leipzig), V. 89, 1914 P 405-413

Descriptors: *Alkaline earth compounds, *Chemical reactions, *Oxidation, *Peroxides, Hydrogen peroxide, Hydroxides, Inorganic peroxides.
For abstract, see STAR 06 12.
N68-22021 HC$3.00 MF$0.65

SULPHUR TETRAFLUORIDE SF4.
le Tetrafluorure de Soufre Sf4
Commissariat A L Energie Atomique, Saclay (France).
P. Boissin, and M. Carles. Dec 67, 32p CEA-B1B-98
Lang- in French, English Summary

Descriptors: *Chemical properties, *Physical properties, *Sulfur fluorides, Bibliographies, Chemical reactions, Fluorination, Toxicity.

For abstract, see STAR 06 12.
N68-22771 HC$3.00 MF$0.65

SOLUBILITY IN THE SYSTEM (NH4)2HPO4-(NH4)2SO4-H2SO4-H3PO4-H2O,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7D.
PB-178 090T HC$3.00 MF$0.65

SOLUBILITY OF AMMONIUM SULFATE IN THE PRESENCE OF SULFURIC AND PHOSPHORIC ACIDS AND ALSO AMMONIUM PHOSPHATES,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7D.
PB-178 091T HC$3.00 MF$0.65

INVESTIGATION OF SPARINGLY SOLUBLE CRYSTALLINE PRECIPITATES. II. GYPSUM,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
A. V. Nikolaev. 17 May 66, 11p TVA-4183
Trans. of Zhurnal Prikladnoi Khimii (USSR) v20 n7 p697-704 1947, tr. by Carol C. Parr.

Descriptors: (*Gypsum, Chemical precipitation), Solutions, Crystallization, Sulfuric acid, Sedimentation, USSR.

The time the solutions are added has little effect on the filtration capacity and the settling rate of gypsum precipitates. With short precipitation periods, precipitates are obtained which change composition with time. The filtration coefficient of gypsum precipitates obtained by various methods varies from 0.000038 to 0.00076 cm./sec. Its increase in some cases can be explained by the loose packing of needle-shaped particles of the precipitate on the filter. The large surface of needle-shaped gypsum crystals is explained by the reduced rate of settling. The citation of the precipitant has a marked effect on the composition of the precipitate. With a certain method of obtaining the precipitates (buffer method) it is possible to surmount the detrimental effect of high concentrations of the precipitant with the result that the quality of the precipitate would not depend on the cation of the precipitant. (Author)
PB-178 092T HC$3.00 MF$0.65

CARBONATE APATITES,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 8G.
PB-178 095T HC$3.00 MF$0.65

SOLUBILITY IN SYSTEMS CONTAINING UREA AND AMMONIUM PHOSPHATES,
Tennessee Valley Authority, Oak Ridge, Wilson Dam, Ala.
For primary bibliographic entry see Field 7D.
PB-178 098T HC$3.00 MF$0.65

A STUDY OF THE PRECIPITATION OF ZINC HYDROXYNITRATES BY AMMONIA,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.

A. K. Kirakosyan, and V. R. Levina. 26 Jun 67. 11p TVA-4251
Trans. of Zhurnal Neorganicheskoi Khimii (USSR) v12 n4 p893-9 1967, tr. by William Hunn.

Descriptors: (*Zinc compounds, Chemical precipitation), (*Nitrates, Chemical precipitation), Hydroxides, Ammonia, Crystallization, Concentration (Chemistry), USSR.
Identifiers: Zinc hydroxynitrates.

Interaction during the precipitation of hydroxynitrates in the system Zn (NO3)2-H2O at 18-20C. was studied by the precipitation method. It was demonstrated that precipitation of zinc hydroxynitrates occurs in two stages. In the first stage zinc precipitation takes place in the form of hydroxynitrates up to value N = 2, but a dissolution of the separated precipitates occurs in the second stage at N > 2. Two forms of salts are precipitated from the system Zn (NO3)2.nZn (OH)2.xH2O and Zn (NO3)2.nZn (OH)2.sNH3.xH2O. Two compounds of constant composition were discovered: Zn (NO3)2.4Zn (OH)2.2NH3.H2O and Zn (NO3)2.3.25Zn (OH)2.1.75NH3. The first compound is precipitated from zinc nitrate solutions of 0.5 moles/l. at N > or = 2.5 and the second from solutions containing 0.25 moles/l. of zinc nitrate at N > or = 2. An oxy nitrate and a zinc hydroxide are simultaneously precipitated from solutions containing 0.1 moles/l. zinc nitrate at N > or = 2, and, depending on N, the precipitates change to oxide over a certain period of time from zinc nitrate solutions of 0.025 moles/l. concentration. (Author)
PB-178 099T HC$3.00 MF$0.65

NEW METHOD OF PREPARING TRISODIUM AMMONIUM AMIDOTRIPHOSPHATE (Na3NH4P3O9NH2),
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
N. M. Dombrovskii, and V. D. Lyakhov. 5 Jan 68, 7p TVA-P-4296
Trans. of Ukrainskii Khimicheskii Zhurnal (USSR) v33 n6 p560-4 1967, tr. by William C. Hunn.

Descriptors: (*Ammonium compounds, Synthesis (Chemistry)), (*Phosphates, Synthesis (Chemistry)), Sodium compounds, Amides, Decomposition, Reaction kinetics, Heat of activation, Ammonia, USSR.
Identifiers: Trisodium ammonium amidotriphosphates, Ammonolysis.

Ammonolysis of the hydrate of sodium trimetaphosphate Na3P3O9.6H2O in a 25% solution of ammonia proceeds at a high rate in the range of 35-95C and is completed in 20 to 25 minutes at 50-60C. The rate of the reaction is satisfactorily described by a zero-order equation, but its dependence on temperature in the range of 45-65C conforms to Arrhenius' law. The activation energy of the reaction equals 7.5 kcal ./mol. The rate of ammonolysis of anhydrous Na3P3O9 in a 25% ammonia solution in the 65-95C range is significantly lower than the rate of reaction of the hydrate under analogous conditions. The reaction rate increases somewhat with a decrease in ammonia concentration, which is demonstrated by the lack of separation of the solution and the absence of formation of two liquid phases. (Author)
PB-178 109T HC$3.00 MF$0.65

SUMMARIES OF THE USAEC BASIC RESEARCH PROGRAM IN CHEMISTRY (OFF-SITE).
Division of Research (AEC), Washington, D. C.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 22 10.
TID-4005-Pt-2A-Ed-3 HC$3.00 MF$0.65

DETERMINATION OF RARE EARTHS AND FLUORIDES IN RARE EARTH FLUORIDES,
California Univ., Livermore. Lawrence Radiation Lab.
L. P. Rigdon, and W. E. Sunderland. 31 Jan 68, 10p
Contract W-7405-eng-48

Descriptors: (*Rare earth compounds, Chemical analysis), Rare earths, Fluorides, Volumetric analysis.

For abstract, see NSA 22 10.
UCRL-50383 HC$3.00 MF$0.65

7C. Organic Chemistry

THE DETERMINATION OF PENTACHLOROPHENYL LAURATE USING ELECTRON CAPTURE GAS CHROMATOGRAPHY,
Defence Standards Labs Maribyrnong (Australia)
P. Dunn, and A. G. Kelso. 1968, 2p
Availability: Published in Journal of Gas Chromatography, v6 p113-4 Feb 1968.

Descriptors: (*Laurates, *Gas chromatography), (*Halogenated hydrocarbons, Gas chromatography), Chlorine compounds, Sodium compounds, Wood, Preservation, Insecticides, Australia.
Identifiers: Pentachlorophenyl laurates.

A quantitative method for the determination of pentachlorophenyl laurate in wood preservative solutions using electron capture gas chromatography is described. The method has advantages over the standard colorimetric method because of its rapidity, sensitivity, and ability to distinguish between the ester and sodium pentachlorophenate if this is present. Dieldrin which may also be present in wood preservative solutions can also be estimated from the chromatogram. (Author)
AD-669 229 Not available from CFSTI.

QUINOLINE ANTIMALARIALS.
Virginia Univ Charlottesville Dept of Chemistry
For primary bibliographic entry see Field 6O.
AD-669 425 HC$3.00 MF$0.65

OXIDATIONS OF AMINES. IV. OXIDATIVE FRAGMENTATION.
Rept. for Jul 65-Jul 66,
Edgewood Arsenal Md
William H. Dennis, Jr., Larry A. Hull, and David H. Rosenblatt. Apr 68, 10p Rept no. EA-SP-100-40
See also AD-654 243.
Availability: Published in Journal of Organic Chemistry, v32 p3783-7 Dec 1967.

Descriptors: (*Amines, Oxidation), (*N-heterocyclic compounds, Oxidation), Decomposition, Alcohols, Ketones, Oxidizers, Chlorine compounds, Dioxides, Sodium compounds, Hypochlorites, Fragmentation.
Identifiers: Oxidative fragmentation.

Oxidation of a representative group of beta-amino and beta-hydroxy amines with either chlorine dioxide or sodium hypochlorite resulted in carbon-carbon cleavage to give formaldehyde along with ammonia or the corresponding primary or secondary amine. The obvious relationship of this reaction to the fragmentation reactions described by Grob and coworkers suggested the term oxidative fragmentation. (Author)
AD-669 597 Not available from CFSTI.

ELECTROPHILIC ADDITIONS TO ACETYLENES.
Final rept.,
California Univ San Diego La Jolla
Robert C. Fahey. 15 Apr 68, 3p
Grant DA-ARO (D)-31-124-G585

Descriptors: (*Alkynes, *Addition reactions), Reaction kinetics, Stereochemistry, Halogenation, Molecular isomerism.

A brief summary is given of work designed to obtain information on the products, rates, stereochemistry, and kinetics of electrophilic additions to acetylenes (especially halogen and hydrogen halide additions) which would clarify the scope and mechanism of these reactions.
AD-669 614 HC$3.00 MF$0.65

PYRIDYL KETONES BY ADDITION OF PYRIDYLLITHIUM TO CARBOXYLIC ACIDS. A NEW SYNTHESIS OF ALPHA- (2-PIPERIDYL)-2-ARYL-4-QUINOLINEMETHANOLS,
Virginia Univ Charlottesville Dept of Chemistry
For primary bibliographic entry see Field 6O.
AD-669 647 Not available from CFSTI.

ANTIMALARIALS. II. ALPHA- (2-PIPERIDYL)- AND ALPHA- (2-PYRIDYL)-2-TRIFLUOROMETHYL-4-QUINOLINE-METHANOLS,
Virginia Univ Charlottesville Dept of Chemistry
For primary bibliographic entry see Field 6O.
AD-669 648 Not available from CFSTI.

ANTIMALARIALS. III. BENZOTHIAZOLE AMINO ALCOHOLS,
Virginia Univ Charlottesville Dept of Chemistry
For primary bibliographic entry see Field 6O.
AD-669 649 Not available from CFSTI.

ANTIMALARIALS. IV. A NEW SYNTHESIS OF ALPHA- (2-PYRIDYL)- AND ALPHA- (2-Piperidyl)-2-ARYL-4-QUINOLINEMETHANOLS,
Virginia Univ Charlottesville Cobb Chemical Lab
For primary bibliographic entry see Field 6O.
AD-669 650 Not available from CFSTI.

MICROWAVE SPECTRA AND STRUCTURES OF ISOTHIAZOLE, 1,2,4-OXADIAZOLE AND IMIDAZOLE,
University Coll of North Wales Bangor Dept of Chemistry
J. H. Griffiths, A. Wardley, Valerie E. Williams, N. L. Owen, and J. Sheridan. May 68, 5p
AFOSR-68-1059
Grant AF-EOAR-90-65
Availability: Published in Nature, v216 n5122 p1301 Dec 30 1967.

Descriptors: (*N-heterocyclic compounds, *Microwave spectroscopy), O-heterocyclic compounds, S-heterocyclic compounds, Molecular structure, Stark effect, Nuclear magnetic resonance, Hyperfine structure, Great Britain.
Identifiers: Isothiazoles, Oxadiazoles, Imidazoles.

Rotational spectroscopy was used to study molecules of isothiazole, 1,2,4-oxadiazole and imidazole. Spectral assignments followed established lines, absorptions being observed for J values between 0 and 18 and in general for both A and B components of the dipole moments. Nuclear quadrupole hyperfine structure was resolvable in all spectra. Analysis of Stark effects permitted the assignment of preliminary values of dipole moment components. (Author)
AD-669 657 Not available from CFSTI.

THE REACTIONS OF PERFLUORONITROSOALKANES WITH THE ETHERS OF PHOSPHOROUS ACID,
Joint Publications Research Service, Washington, D. C.
B. L. Dyatkin, E. P. Mochalina, Yu. S. Konstantinov, S. R. Sterlin, and I. L. Knunyants. 22 Mar 68, 14p
Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Khimicheskaya, n10 p2297-305 1967.

Descriptors: (*Organic phosphorus compounds, Chemical reactions), (*Nitroso compounds, Chemical reactions), Halogenated hydrocarbons, Fluorine compounds, Alkanes, Ethers, Phosphites, Oximes, Ketones, Oxides, Nitriles, Synthesis (Chemistry), USSR.

Depending on the structure of perfluoronitrosoalkanes, their reactions with triethylphosphite result in fluoro-containing phosphaso compounds, ethyl ethers of the oximes of perfluoroketones, and oxides of perfluoronitriles. New examples of the chemical analogy of perfluoronitrosoaklanes and perfluoroketones were found. The results obtained agree with the concept of the basic attack of phosphite on a nitrogen atom of the nitroso group. (Author)
JPRS-44780 HC$3.00 MF$0.65

MASS SPECTRA AND PYROLYSIS OF SOME AROMATIC-FLUOROALIPHATIC COMPOUNDS.
Royal Aircraft Establishment, Farnborough (England).
For primary bibliographic entry see Field 7D.
For abstract, see STAR 06 12.
N68-22603 HC$3.00 MF$0.65

SYNTHESIS AND STUDY OF PYRROLIDINIC NITROXIDE FREE RADICALS. PREPARATION OF A NITROXIDE- TYPE STABLE BIRADICAL.
Syntheses Et Etudes de Radicaux Libres Nitroxydes Pyrrolidiniques. Preparation D'un Biradical Stable Du Type Nitroxyde
Commissariat A L Energie Atomique, Grenoble (France).
R.-M. Dupeyre. Dec 67, 111p CEA-R-3176
Lang- in French

Descriptors: *Amines, *Free radicals, *Nitrous oxides, *Reduction (chemistry), Hydrogen peroxide, Oxidation, Pyrroles, Radicals, Spectrum analysis.

For abstract, see STAR 06 12.
N68-22613 HC$3.00 MF$0.65

POLYDIMETHYLSILOXANES MODIFIED BY THE INTRODUCTION OF DINEOPENTYLENE PHOSPHONATE GROUPS.
Royal Aircraft Establishment, Farnborough (England).
M. A. Hewins, and I. M. White. Apr 67, 51p
RAE-TR-67073

Descriptors: *Addition resins, *Copolymerization, *Methyl polysiloxane, *Polymer chemistry, Dimers, Phosphorus compounds, Silicon compounds, Siloxanes, Synthetic rubbers.

For abstract, see STAR 06 12.
N68-22650 HC$3.00

7D. Physical Chemistry

HYDROGEN-LIKE ANALYTIC ORBITALS OF ATOMIC SPECIES OF CARBON AND OXYGEN TYPE (ANGLIES IR DEGUONIES TIPO ATOMU VANDENILISKOS ANALIZINES BANGINES FUNKCIJOS),
American Meteorological Society Boston Mass
A. Kancerevicius, and V. Jezerskis. May 66, 10p
Rept no. T-L-16
Contract AF 19 (628)-3880
Trans. of Vilna Univ. Mokslo Darbai (Lithuanian SSR) n25 Matematikos, Fizikos ir Chemijos Mokslu Serija, n8 p101-7 1958, by Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Carbon, Oxygen, Nitrogen, Fluorine, Neon, Sodium, Ions, Ground state, Configuration, Atomic energy levels, USSR.
Identifiers: Translations.

The parameters of hydrogen-like analytic orbitals are established for atomic species of carbon type (C, N (+), O (++), and F (3+) and of oxygen type (O, F (+), Ne (++), and Na (3+) in the ground configurations. The two-configuration approximation 1s (2)2s (2)2p (n)-1s (2)2p (n+2) (n = 2, 4) is applied on the basis of both single-configuration and two-configuration orbitals. The fine structure is calculated for the triplet terms. Empirical expressions are presented for obtaining some two-configuration orbitals for correction configurations. (Author)
AD-669 159 HC$3.00 MF$0.65

CALCULATION OF THE SPLITTING OF A TRIPLET TERM OF THE POSITIVE ION OF NITROGEN (TRIPLETINIO TERMO SUSKILIMO SKAICIAVIMAS TEIGIAMO AZOTO IONO ATVEJU),
American Meteorological Society Boston Mass
T. D. Strotskite, and A. P. Yutsis. Oct 66, 6p
Rept no. T-L-13
Contract AF 19 (628)-3880
Trans. of Vilna Univ. Mokslo Darbai (Lithuanian SSR) n11 Mathematikos, Fizikos ir Chemijos Mokslu Serija, n6 p39-42 1956, by Stuart W. Kellogg.

Descriptors: (*Nitrogen, *Atomic orbitals), Atomic spectroscopy, Ions, Atomic energy levels, Configuration, Approximation (Mathematics), USSR.
Identifiers: Fock self-consistent-field equations, Translations.

It was previously shown (see CFSTI reports TT-61-19029 and TT-64-19580) that Fock self-consistent-field orbitals permit rather accurate theoretical evaluation of the splitting of terms, while analytic orbitals are suitable only if the progressions of the splitting follow in isoelectronic sequences. In the present paper, results are presented for the theoretical splitting of the triplet term in the ground configuration of the positive ion of nitrogen.
AD-669 160 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD IN THE MULTICONFIGURATION APPROXIMATION FOR THE NEGATIVE ION OF POTASSIUM (SAMOSOGLASOVANNOE POLE FOKA V MNOGOKONFIGURATSIONNOM PRIBLIZHENII DLYA OTRITSATELNOGO IONA KALIYA),
American Meteorological Society Boston Mass
T. D. Strotskite, and A. P. Yutsis. Oct 65, 11p
Rept no. T-R-500
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n3 (19) p3-9 1959, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Potassium, *Atomic orbitals), Atomic spectroscopy, Atomic energy levels, Configuration, Approximation (Mathematics), Ionization potentials, Tables, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

Solutions to the Fock equations are presented in the multiconfiguration approximation for the 4p and 3d radial orbitals as the correction configurations of the two-configuration approximations 4s (2)-4p (2) and 4s (2)-3d (2), in the case of the negative ion of potassium. The energy value of the 4s (2) shell is determined in the three-configuration approximation 4s (2)-4p (2)-3d (2). The value of the electron affinity of the potassium atom is presented in the indicated three-configuration approximation. (Author)
AD-669 161 HC$3.00 MF$0.65

REFINEMENT OF THE CALCULATION OF FORBIDDEN SPECTRAL LINES (OB UTOCHENENII RASCHETA AZPRESHCHENNYKH SPEKTRALNYKH LINII),
American Meteorological Society Boston Mass
A. P. Yutsis, and Ya. I. Vizbaraite. Oct 65, 4p
Rept no. T-R-504
Contract AF 19 (628)-3880
Trans. of Vilna Univ. Astronomijos Observatorija Biuletenis (Lithuanian SSR) n2 p3-6 1960, by George E. Brady, Jr.

Descriptors: (*Atomic spectroscopy, *Selection rules), Line spectrum, Electron transitions, Numerical analysis, Interactions, Atomic energy levels, USSR.
Identifiers: Translations.

Forbidden spectral lines include electric quadrupole and magnetic dipole transitions. In view of the practical impossibility of laboratory study of such lines, their theoretical calculation acquires special significance. It turns out that a rather significant refinement of the calculation is realized by the selection of a suitable type of coupling in the initial and final states of the atom or ion. If the examination involves equivalent electrons, the coupling in the general case is intermediate between two types of homogeneous coupling. In the case of nonequivalent electrons, nonhomogeneous couplings acquire great significance. The first of these couplings are formally simple, but the second correspond to consecutive addition of momenta. The results of allowance for nonhomogeneous couplings in the study of forbidden lines are illustrated with the two-electron spectrum as an example. (Author)
AD-669 165 HC$3.00 MF$0.65

A REFINED METHOD OF CALCULATION FOR AN EXCITED POSITIVE ION OF CARBON (UTOCHNENNYI METOD RASCHETA V SLUCHAE VOZBUZHDENNOGO POLOZHITELNOGO IONA UGLERODA),
American Meteorological Society Boston Mass
I. I. Glembotskii, E. V. Mauza, and A. P. Yutsis.
Aug 65, 11p Rept no. T-R-499
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n4 (12) p39-46 1957, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Carbon, *Atomic orbitals), Atomic spectroscopy, Ions, Atomic energy levels, Excitation, Configuration, Hartree-Fock approximation, Wave functions, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

A refined Fock equation is solved for the outer electron at the 3d level in the positive ion of carbon. The resulting orbital is compared with the solutions to the less exact equations. Solutions to the Fock and Hartree equations are also presented for the case of excitation of the outer electron to the 3p level. Values of the total energy are determined in the multiconfiguration approximation on the basis of the two-electron-state model. (Author)
AD-669 166 HC$3.00 MF$0.65

THE FORMS OF THE EQUATIONS OF THE SELF-CONSISTENT FIELD (O VIDAKH URAVNENII SAMOSOGLASOVANNOGO POLYA),
American Meteorological Society Boston Mass
A. P. Yutsis, and Ya. I. Vizbaraite. Apr 65, 10p
Rept no. T-R-470
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n3 (26) p11-7 1961, by Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Wave functions, Hartree-Fock approximation, Equations, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

It is pointed out that neglect of the exchange terms between shells in the Fock equations leads to equations that differ substantially from the Hartree equations in the general case. However, the use of an atomic wave function in the form of a single product of orbitals is ambiguous. It is shown that the Hartree equations can be obtained unambiguously by the use of an atomic function in the form of a product of radial orbitals. The atomic wave function expressed as a single determinant in the

'unrestricted' Hartree-Fock method is pointed out to be ambiguous. (Author)
AD-669 167 HC$3.00 MF$0.65

THE FOCK SELF-CONSISTENT FIELD IN THE MULTICONFIGURATION APPROXIMATION FOR THE HELIUM ATOM (SAMOSOGLASOVANNOE POLE FOKA V MNOGOKONFIGURATSIONNOM PRIBLIZHENII DIYA ATOMA GELIYA),
American Meteorological Society Boston Mass
Ya. I. Vizbaraite, V. I. Shironas, V. I. Kavetskis, and A. P. Yutsis. Apr 65, 10p Rept no. T-R-471
Contract AF 19 (628)-3880
Trans. of Optika i Spektroskopiya (USSR), v1 n3 p277-81 1956, by Stuart W. Kellogg.

Descriptors: (*Helium, *Atomic orbitals), Atomic spectroscopy, Atomic energy levels, Excitation, Configuration, Approximation (Mathematics), USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The solution of the Fock equations are presented in two-configuration approximation for the configurations 2p (2), 2s (2), 3d (2), and 3p (2), regarded as excited configurations with respect to the ground configuration of the helium atom. These solutions are used to evaluate the correction to the energy of the ground configuration for various multiconfiguration approximations. The value of the energy as determined by the Fock self-consistent-field method is presented in the six-configuration approximation 1s (2)-2p (2)-2s (2)-3d (2)-3p (2)-2p3p and compared with the experimental energy value. (Author)
AD-669 168 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD FOR DOUBLY IONIZED NITROGEN (SAMOSOGLASOVANNOE POLE FOKA DYLA DVUKRATNOGO IONA AZOTA),
American Meteorological Society Boston Mass
I. I. Glembotskii, T. D. Strotskite, and A. P. Yutsis. Jul 65, 5p Rept no. T-R-492
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n2 (5) p11-4 1956, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Nitrogen, *Atomic orbitals), Atomic spectroscopy, Ions, Ground state, Configuration, Wave functions, Numerical analysis, Tables, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

Solutions to the equations of the Fock self-consistent field for the ground configuration of doubly ionized nitrogen are presented. The total energy is determined with these solutions in both the single-configuration and the two-configuration approximations. The theoretical results are compared with experimental data. (Author)
AD-669 169 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD IN THE TWO-CONFIGURATION APPROXIMATION FOR NITROGEN IN VARIOUS DEGREES OF IONIZATION (SAMOSOGLASOVANNOE POLE FOKA V DVUKHKONFIGURATSIONNOM PRIBLIZHENII DLYA ATOMA AZOTA V RAZNYKH STEPENYAKH IONIZATSII),
American Meteorological Society Boston Mass
Ya. I. Vizbaraite, I. V. Batarunas, V. V. Kibartas, and A. P. Yutsis. Apr 65, 10p Rept no. T-R-496
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n5 (8) p3-10, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Nitrogen, *Atomic orbitals), Atomic spectroscopy, Ions, Atomic energy levels, Excitation, Configuration, Approximation (Mathematics), Tables, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The Fock equation in the two-configuration approximation is solved for the 2p radial orbital of the excited configuration 1s (2)2p (q+2) of the two-configuration approximation 1s (2)2s (2)2p (q)-1s (2)2p (q+2) with q = 2, 3, and 4 in the case of nitrogen. Energy values of the 2s and 2p electrons are determined and compared with the experimental data. (Author)
AD-669 170 HC$3.00 MF$0.65

TWO-CONFIGURATION APPROXIMATION FOR THE CALCIUM ATOM (DVUKHKONFIGURATSIONNOE PRIBLIZHENIE V SLUCHAE ATOMA KALTSIYA),
American Meteorological Society Boston Mass
T. D. Strotskite, and A. P. Yutsis. Aug 65, 10p Rept no. T-R-502
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n2 (25) p93-8 1961, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Calcium, *Atomic orbitals), Atomic spectroscopy, Atomic energy levels, Configuration, Approximation (Mathematics), Ionization potentials, Electron transitions, Tables, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The Fock equation in the two-configuration approximation is solved with the 4p radial orbital of the calcium atom in the correction configuration of the approximation 4s (2)-4p (2). The energy value of the 4s (2) shell is determined in the indicated two-configuration approximation. The ionization potential of the neutral atom is presented. Thoeretical results are compared with experimental data. Transition theory quantities are also determined in the two-configuration approximation. (Author)
AD-669 171 HC$3.00 MF$0.65

THE MATHEMATICAL PROBLEM OF THE MULTICONFIGURATION APPROXIMATION (MATEMATICHESKAYA ZADACHA MNOGOKONFIGURATSIONNOGO PRIBLIZHENIYA),
American Meteorological Society Boston Mass
A. P. Yutsis, and Ya. I. Vizbaraite. Oct 65, 13p Rept no. T-R-503
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n3 (26) p3-10 1961, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Atomic energy levels, Wave functions, Configuration, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The Ritz method is generalized in the sense that it is combined with the variation method to find approximate eigenfunctions. It is shown that this generalized Ritz method comprises a mathematical basis for the method of the Fock self-consistent field in the multiconfiguration approximation. Methods are indicated for simplifying the corresponding equations, which permit calculations to be carried out without certain difficulties connected with the nonsimplified equations. (Author)
AD-669 172 HC$3.00 MF$0.65

APPROXIMATE ORBITALS FOR EXCITED LEVELS OF THE POSITIVE ION OF OXYGEN (PRIBLIZHENNE ODNOELEKTRONNYE VOLNOVYE FUNKTSII DLYA VOZBUZHDENNYKH UROVNEI POLOZHITELNOGO IONA KISLORODA),
American Meteorological Society Boston Mass
I. I. Glembotskii, and L. L. Kuzmitskite. Aug 65, 15p Rept no. T-R-501
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n1 (21) p87-98 1960, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Oxygen, *Atomic orbitals), Atomic spectroscopy, Ions, Atomic energy levels, Configuration, Approximation (Mathematics), Electron transitions, Integrals, Tables, USSR.
Identifiers: Translations.

Radial orbitals and diagonal Lagrange multipliers are presented for the outer electron of the ion O (+) in the configuration 1s (2) 2s (2) 2p (2) nl where nl = 3s, 3p, 3d, 4s, 4p, 4d, 4f, 5s, 5p, 5d, 5f. Values of the radial integrals are determined with the help of these functions for the possible electric dipole transitions between the indicated levels. All the basic calculations are carried out with a Strela computer. (Author)
AD-669 173 HC$3.00 MF$0.65

SIMPLIFYING THE FOCK EQUATIONS (K VOPROSU OB UPROSHCHENII URAVNENII FOKA),
American Meteorological Society Boston Mass
I. I. Glembotskii, V. K. Shugurov, and A. P. Yutsis. Aug 65, 11p Rept no. T-R-497
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n2 (10) p3-10 1957, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Equations), Atomic spectroscopy, Beryllium, Ground state, Configuration, Wave functions, Integrals, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The Fock equations are simplified by substituting simpler expressions for the exchange terms using the Fock theory of the classical analog of the operator of electrostatic interaction of exchange type and the virial theorem. Equations simplified in this manner are solved for the ground configuration of beryllium. A semi-empirical substitute is formulated for the exchange terms and also verified using this example. Wave functions, obtained by the methods referred to, are compared to the solutions to the exact Fock equations and also to the corresponding solutions to the Hartree equations. (Author)
AD-669 174 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD IN THE TWO-CONFIGURATION APPROXIMATION FOR ATOMIC SPECIES OF BORON TYPE (SAMOSOGLASOVANNOE POLE FOKA V DVUKHKONFIGURATSIONNOM PRIBLIZHENII DLYA ATOMOV TIPA BORA),
American Meteorological Society Boston Mass
I. V. Batarunas, Ya. I. Vizbaraite, and A. P. Yutsis. Aug 65, 9p Rept no. T-R-495
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n4 (7) p15-20 1956, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Boron, Carbon, Nitrogen, Oxygen, Ions, Atomic energy levels, Excitation, Configuration, Tables, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

Solutions to the Fock equation in the two-configuration approximation are presented for the 2p radial orbital of the excited configuration of the two-configuration approximation 1s (2)2s (2)2p-1s (2)2p (3) and the energy values of the 2s and 2p electrons for B, C (+), N (++), and O (3+). (Author)
AD-669 175 HC$3.00 MF$0.65

HARTREE SELF-CONSISTENT FIELD IN THE TWO-CONFIGURATION APPROXIMATION FOR THE TWO LOWEST CONFIGURATIONS

OF THE CARBON ATOM (SAMOSOGLASOVANNOE POLE KHARTRI V DVUKHKONFIGURATSIONNOM PRIBLIZHENNII DYLA DVUKH NIZSHIKH KONFIGURATSII ATOMA UGLEROGDA),

American Meteorological Society Boston Mass
A. P. Yutsis, V. V. Kibartas, and I. Yu. Petkyavichyus. Aug 65, 16p Rept no. T-R-494
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n4 (7) p3-14 1956, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Carbon, *Atomic orbitals), Atomic spectroscopy, Atomic energy levels, Configuration, Excitation, Electron transitions, Numerical analysis, Tables, USSR.
Identifiers: Hartree self-consistent-field equations, Translations.

The method of the Hartree self-consistent field, extended to the case of the two-configuration approximation, is applied to the two lowest configurations of the carbon atom. The Hartree equations, augmented by configuration terms, are solved for the 2p radial orbital of the excited configurations and the values of the total energy are presented. In the approximation in question, the effect of mass on the spectral lines that result from transitions between the investigated configurations, is determined and compared with both the less accurate, earlier theoretical results and the experimentally observed isotopic shift. (Author)
AD-669 176 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD FOR THE POSITIVE ION OF NITROGEN (SAMOSOGLASOVANNOE POLE FOKA DLYA POLOZHITELNOGO IONA AZOTA),

American Meteorological Society Boston Mass
T. D. Strotskite, I. I. Glembotskii, and A. P. Yutsis. Aug 65, 10p Rept no. T-R-493
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n3 (6) p3-9 1956, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Nitrogen, *Atomic orbitals), Atomic spectroscopy, Ions, Atomic energy levels, Ground state, Configuration, Approximation (Mathematics), Tables, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

Solutions to the Fock equations of the self-consistent field are presented for the ground configuration of the positive ion of nitrogen. Values for the total energy of both the single-configuration and the two-configuration approximations are determined with these solutions. (Author)
AD-669 177 HC$3.00 MF$0.65

THE MULTICONFIGURATION APPROXIMATION FOR ATOMIC SPECIES OF HELIUM TYPE (MNOGOKONFIGURATSIONNOE PRIBLIZHENIE V SLUCHAE ATOMOV TIPA GELIYA),

American Meteorological Society Boston Mass
Ya. I. Vizbaraite, V. I. Kavetskis, and A. P. Yutsis. Apr 65, 8p Rept no. T-R-472
Contract AF 19 (628)-3880
Trans. of Optika i Spektroskopiya (USSR), v1 n3 p282-4 1956, by Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Helium, Hydrogen, Lithium, Beryllium, Boron, Carbon, Ions, Atomic energy levels, Ground state, Configuration, Wave functions, Tables, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The multiconfiguration approximation is applied to the ground configuration of atomic species of helium type from H (-) to C (4+) by a method in which the results of the self-consistent field are used for the ground configuration, while the corrections to the energy for the multiconfiguration approximation are determined with hydrogen-like analytic wave functions. The resulting values of the total energy are compared with the results of application of the method of partial separation of variables and with the experimental data. (Author)
AD-669 178 HC$3.00 MF$0.65

SELECTION OF INITIAL DATA FOR NUMERICAL SOLUTION OF SELF-CONSISTENT-FIELD EQUATIONS (O PODBORE ISKHODNYKH DANNYKH PRI CHISLENNOM RESHENII URAVENENII SAMOSOGLASOVANNOGO POLYA),

American Meteorological Society Boston Mass
A. Kantseryavichyus. Jun 65, 16p Rept no. T-R-484
Contract AF 19 (628)-3880
Trans. of Lietuvos Fizikos Rinkinys (Lithuanian SSR), v1 n3/4 p299-308 1961, by Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Equations), Atomic spectroscopy, Atomic energy levels, Approximation (Mathematics), Numerical analysis, USSR.
Identifiers: Fock self-consistent-field equations, Hartree self-consistent-field equations, Translations.

Proposals are advanced concerning means of finding initial values of diagonal Lagrange multipliers and approximate means of finding values of radial orbitals for small and large r. The relevant analysis shows good agreement between data computed by the proposed means and corresponding data obtained from self-consistent-field equations. (Author)
AD-669 181 HC$3.00 MF$0.65

THE FOCK SELF-CONSISTENT FIELD FOR A 6D VALENCE ELECTRON IN THE LITHIUM ATOM (SAMOSOGLASOVANNOE POLE FOKA V SLUCHAE VALENTNOGO ELEKTRONA 6D ATOMA LITIYA),

American Meteorological Society Boston Mass
I. T. Martishyus. Jun 65, 5p Rept no. T-R-483
Contract AF 19 (628)-3880
Trans. of Lietuvos Fizikos Rinkinys (Lithuanian SSR), v1 n1/2 p97-100 1961, by Stuart W. Kellogg.

Descriptors: (*Lithium, *Atomic orbitals), Atomic spectroscopy, Atomic energy levels, Ground state, Configuration, Valence, Ionization potentials, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

A simplified method previously presented is used to solve the Fock self-consistent-field equation for a 6d valence electron of the lithium atom. The values of the total energy and ionization potential are determined. The resulting radial orbital of the Fock self-consistent field is used to determine the doublet splitting of a term of the configuration 1s (2)6d. (Author)
AD-669 182 HC$3.00 MF$0.65

RESULTS OF THE EVALUATION OF HARTREE PARAMETERS OF HYDROGEN-LIKE ORBITALS (NEKOTORYE REZULTATY PO OPREDELENIYU KHARTIEVSKIKH PARAMETROV VODORODOPODOBNYKH ODNOELEKTRONNYKH VOLNOVYKH FUNKSII),

American Meteorological Society Boston Mass
A. Karosiene, J. Karosas, and A. Yutsis. Oct 66, 11p Rept no. T-R-647
Contract AF 19 (628)-3880
Trans. of Lietuvos Fizikos Rinkinys (Lithuanian SSR), n2 p137-42 1962, by Irvin Schenkmann, and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Hydrogen, Atomic energy levels, Configuration, Wave functions, Numerical analysis, USSR.
Identifiers: Hartree self-consistent-field equations, Translations.

A quantity whose variation leads to Hartree self-consistent field equations is used to evaluate the parameters of hydrogen-like orbitals. The values of these parameters are given for isoelectronic series of 1s2s, 1s2p, 1s (2)2s, 1s (2)2p, and 1s (2)2p (2). The approximation inherent in these new values of the parameters is compared with the parameters as evaluated by variation of the quantity that leads to Fock self-consistent field equations in the application of the Fock variation method. (Author)
AD-669 183 HC$3.00 MF$0.65

APPLICATION OF THE METHOD OF PARTIAL SEPARATION OF VARIABLES TO TWO EQUIVALENT p ELECTRONS (PRIMENENIE METODA NEPOLNOGO RAZDELENIYA PEREMENNYKH K DVUM EKVIVALENTNYM P-ELEKTRONAM),

American Meteorological Society Boston Mass
A. P. Yutsis. Sep 66, 26p Rept no. T-R-640
Contract AF 19 (628)-3880
Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki (USSR) v23 n4 p357-70 1952, by George E. Brady, Jr.

Descriptors: (*Atomic orbitals, Integrals), Atomic spectroscopy, Helium, Lithium, Beryllium, Ions, Atomic energy levels, Wave functions, Valence, Kinetic energy, Electrostatics, USSR.
Identifiers: Translations.

A method is worked out for applying the partial separation of variables in the Fock-Veselov-Petrashen' theory to atomic species with two valence p electrons, and there is an examination of the radial integrals that express the total energy of the species with partial separation of variables after integration over the spin and angular variables. Techniques are developed for computing the kinetic energy integrals and the integrals for exchange-type electrostatic energy. The numerical results of calculations with partial separation of variables are given for He, Li (+), and Be (++) in the configuration 2 p (2). (Author)
AD-669 184 HC$3.00 MF$0.65

FRACTIONAL PARENTAGE COEFFICIENTS OF A CONFIGURATION WITH SEVERAL SHELLS (GENEALOGICHESKIE KOEFFITSIENTY KONFIGURATSII S NESKOLKIMI OBOLOCHKAMI),

American Meteorological Society Boston Mass
I. B. Levinson. Aug 66, 23p Rept no. T-R-644
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya BM4 (12) p17-31 1957, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Wave functions), Atomic spectroscopy, Matrix algebra, Operators (Operators), Transformations (Mathematics), USSR.
Identifiers: Translations.

The wave functions of a configuration consisting of an arbitrary number of shells are formulated by coupling of the momenta of the antisymmetric wave functions of the individual shells and by subsequent antisymmetrization of the resulting wave function through exchanges of particle coordinates among the shells. The fractional parentage coefficients of these wave functions are expressed as the product of one or two fractional parentage coefficients per individual shell times the matrix element of the matrix of transformation between the various angular-momentum coupling schemes. Formulas are derived for calculating the matrix elements of the symmetric operators. (Author)
AD-669 185 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD IN THE TWO-CONFIGURATION APPROXIMATION FOR THE FIRST EXCITED CONFIGURATION OF BORON (SAMOSOGLASOVANNOE POLE FOKA V DVUKHKONFIGURATSIONNOM PRIBLIZHENII DLYA PERVOI VOZBUZHDENNOI KONFIGURATSI ATOMA BORA),

American Meteorological Society Boston Mass
A. P. Yutsis, V. V. Kibartas, and K. V. Konstan-

tinavichyus. Aug 65, 8p Rept no. T-R-498
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n4 (12) p33-8 1957, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Boron, *Atomic orbitals), Atomic spectroscopy, Atomic energy levels, Configuration, Excitation, Approximation (Mathematics), USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The Fock equation is solved for the 3s radial orbital of the configuration 1s (2)2s (2)3s of boron, while the other orbitals practically coincide with the corresponding orbitals of the positive ion of boron. The total energy value in the two-configuration approximation 1s (2)2s (2)3s-1s (2)2p (2)3s is determined and compared with the experimental value. It is pointed out that the two-configuration approximation in the case in question is not the same as in the case of the ground configuration of the same atom. (Author)
AD-669 186 HC$3.00 MF$0.65

EXPERIMENTAL DETERMINATION OF THE POSITION OF THE COESITESTISHOVITE PHASE EQUILIBRIUM CURVE (EKSPERIMENTALNOE OPREDELENIE POLOZHENIYA KRIVOI FAZOVOGO RAVNOVESIYA KOUSITSTISHOVIT),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 8G.
AD-669 187 HC$3.00 MF$0.65

SOLUTION OF THE FOCK EQUATIONS FOR THE BERYLLIUM ATOM IN A TWO-CONFIGURATION APPROXIMATION (RESHENIE URAVNENII FOKA DLYA ATOMA BERILLIYA V DVUKHKON-FIGURATSIONNOM PRIBLIZHENII),
American Meteorological Society Boston Mass
V. V. Kibartas, and A. P. Yutsis. Feb 65, 12p
Rept no. T. R. /466
Contract AF 19 (628)-3880
Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki (USSR) v25 n3 (9) p264-70 1953, by Stuart W. Kellogg.

Descriptors: (*Beryllium, *Atomic orbitals), Atomic spectroscopy, Atomic energy levels, Ground state, Approximation (Mathematics), Wave functions, Tables, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The Fock equations are given in the two-configuration approximation for the ground configuration of the neutral beryllium atom. The radial wave functions obtained with the solution of the Fock equations are also given in both a single-configuration and a two-configuration approximation. These functions are used to determine the total energy, including the correction from the two-configuration approximation. (Author)
AD-669 188 HC$3.00 MF$0.65

TWO-CONFIGURATION APPROXIMATION FOR ATOMIC SPECIES OF NITROGEN TYPE (DVUKHKONFIGURATSIONNOE PRIBLIZHENENIE V SLUCHAE ATOMOV TIPA AZOTA),
American Meteorological Society Boston Mass
I. B. Levinson, A. B. Bolotin, and L. I. Levin.
May 66, 9p Rept no. T-R-618
Contract AF 19 (628)-3880
Trans. of Vilna Univ. Mokslo Darbai (Lithuanian SSR) n8 Matematikos, Fizikos ir Chemijos Mokslu Serija, n5 p49-55 1956, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Nitrogen, Oxygen, Fluorine, Neon, Ions, Atomic energy levels, Electron transitions, Probability, Approximation (Mathematics), Integrals, Tables, USSR.
Identifiers: Translations.

Values of the parameters of analytic orbitals of the atomic species N, O (+), F (++), and Ne (3+) are given for the configurations 1s (2)2s (2)2p (3), 1s (2)2s2p (4), and 1s (2)2p (5). The correction to the energy for the two-configuration approximation 1s (2)2s (2)2p (3)-1s (2)2p (5) is determined for all the aforementioned atomic species. The resulting theoretical energy values are compared with experimental data. The total dipole strengths and the probabilities of the transition 1s (2)2s2p (4)-1s (2)2s (2)2p (3) are determined in both the single-configuration and the two-configuration approximations. The general formula for the total dipole strength is formulated in the two-configuration approximation with radial integrals for the transitions between the s and p shells. (Author)
AD-669 191 HC$3.00 MF$0.65

PROPERTIES OF ORBITALS IN THE EXTENDED METHOD OF CALCULATION (O SVOISTVAKH VOLNOVYKH FUNKTSII V RASSHIRENNOM METODE RASCHETA),
American Meteorological Society Boston Mass
K. K. Eringis, Ya. I. Vizbaraite, and A. P. Yutsis.
Mar 66, 6p Rept no. T-R-614
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk SSSR. Komissiya po Spektroskopii. Trudy, n1 p81-86 1964, also published as Soveshchanie po Spektroskopii (no. 15) Minsk, 5-11 Jul 63. Materialy v2 n.p., n.d., by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Wave functions), Atomic spectroscopy, Atomic energy levels, Approximation (Mathematics), Operators (Mathematics), Configuration, USSR.
Identifiers: Translations.

The constants of orbitals of the same shell differ greatly from each other, which leads to an extension of the theory as compared to the conventional method of calculation. Apparently, the energy does not reach its minimum with only a single set of constants of the orbitals, which indicates the practical equality of the two constants with $q = 4$, but not with any other value of q. In all cases, the energy data are improved in the transition from the conventional method to the extended method. (Author)
AD-669 193 HC$3.00 MF$0.65

MEASUREMENT OF THE COEFFICIENTS OF COHERENT AMPLIFICATION OF NEON LINES IN A HELIUM-NEON MIXTURE (IZMERENIE KOEFFITSIENTOV KOGERENTNOGO USILENIYA LINII NEONA V SMESI GELII-NEON),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 20E.
AD-669 194 HC$3.00 MF$0.65

TWO-CONFIGURATION APPROXIMATION FOR THE CONFIGURATION 1s (2)2s (2)2p3s OF CARBON (DVUKHKONFIGURATSIONNOE PRIBLIZHENIE V SLUCHAE KONFIGURATSII 1s (2)2s (2)2p3s ATOMA UGLERODA),
American Meteorological Society Boston Mass
G. K. Tsyunaitis, and A. P. Yutsis. Feb 66, 7p
Rept no. T-R-604
Contract AF 19 (628)-3880
Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki (USSR), v25 n6 (12) p679-82 1953, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Carbon, *Atomic orbitals), Atomic spectroscopy, Atomic energy levels, Configuration, Approximation (Mathematics), Tables, USSR.
Identifiers: Hartree self-consistent-field equations, Translations.

Solutions to the equations of the Hartree self-consistent field are given for the configuration 1s (2)2s (2)2p3s of carbon. With these solutions, the two-configuration approximation 1s (2)2s (2)2p3s-1s (2)2p (3)3s is applied to the first of these configurations. The resulting theoretical energy values are compared to the experimental data. (Author)
AD-669 195 HC$3.00 MF$0.65

THEORETICAL DETERMINATION OF THE PROBABILITY OF AN ELECTRIC QUADRUPOLE TRANSITION (K VOPROSU O TEORETICHESKOM OPREDELENII VEROYATNOSTI ELEKTRICHESKOGO KVADRUPOLNOGO PEREKHODA),
American Meteorological Society Boston Mass
A. P. Yutsis, and Ya. I. Vizbaraite. Apr 66, 21p
Rept no. T-R-596
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n1 (17) p3-16 1959, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), (*Electron transitions, Probability), Atomic spectroscopy, Atomic energy levels, Electric moments, Quadrupole moments, Configuration, Tensor analysis, Carbon, Oxygen, Nitrogen, Line spectrum, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The process of calculations on the theoretical determination of the electric quadrupole strength is systematized to a certain extent. The requisite formulas of the mathematics of tensor operators are given for configurations with one and two unfilled shells. It is shown how to apply the multiconfiguration approximation to the theoretical determination of the probability of a quadrupole transition. The effect of the multiconfiguration approximatior on the results of calculations for atomic species of carbon, nitrogen, and oxygen type is examined. The radial integral appearing in the expression for the probability of a quadrupole transition is evaluated both with analytic orbitals and with solutions to the Fock self-consistent-field equations for a number of atomic species of the aforementioned types. (Author)
AD-669 196 HC$3.00 MF$0.65

FORMULATION OF APPROXIMATE RADIAL ORBITALS (K VOPROSU O POSTROENII PRIBLIZHENNYKH RADIALNYKH VOLNOVYKH FUNKSTII),
American Meteorological Society Boston Mass
I. I. Glermbotskii, and A. P. Yutsis. Apr 66, 7p
Rept no. T-R-600
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n2 (10) p11-6 1957, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Carbon, Calcium, Atomic energy levels, Ground state, Ions, Configuration, USSR.
Identifiers: Translations.

The formulation of approximate radial orbitals for outer electron shells is refined by replacing the constant scale factor by a corresponding linear function of the distance from the nucleus. Calculations are made for the ground configuration of doubly ionized carbon and calcium. The resulting orbitals are compared with solutions to the Fock equations of the self-consistent field. (Author)
AD-669 197 HC$3.00 MF$0.65

APPLICATION OF THE MULTICONFIGURATION APPROXIMATION TO ATOMIC SPECIES OF CARBON, NITROGEN, AND OXYGEN TYPE (K VOPROSU O PRIMENENII MNOGOKONFIGURATSIONNOGO PRIBLIZHENIYA V SLUCHAE ATOMOV TIPA UGLERODA, AZOTA I KISLORODA),
American Meteorological Society Boston Mass
Ya. I. Vizbaraite, and A. P. Yutsis. Mar 66, 24p
Rept no. T-R-597
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, m1 (17) p17-35 1959, by George E. Brady, Jr., and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Carbon,

Nitrogen, Oxygen, Ions, Atomic energy levels, Configuration, Integrals, USSR.
Identifiers: Translations.

The problem examined is the form of the multiconfiguration approximation that should be employed to improve the calculation of atomic species of carbon, nitrogen, and oxygen type. It is shown how to express the elements of the energy matrix with radial integrals when applying the multiconfiguration approximation to a configuration of equivalent electrons on the basis of the model of two-electron states. A way is found to determine the correction to the energy for the multiconfiguration approximation in configurations containing any number of equivalent electrons. This is done with corrections for configurations with two equivalent electrons. Numerical values are given for the ratios of term separations for several atomic species of carbon, nitrogen, and oxygen type as determined by multiconfiguration approximations based on the model of two-electron states. An appendix contains the formulas of quantities from the theory of vector addition of angular momenta that are needed in deriving formulas for certain elements of the energy matrix. (Author)
AD-669 198 HC$3.00 MF$0.65

MULTICONFIGURATION APPROXIMATION FOR THE CASE OF EQUIVALENT ELECTRONS (MNOGOKONFIGURATSIONNOE PRIBLIZHENIE V SLUCHAE EKVIVALENTNYKH ELEKTRONOV),
American Meteorological Society Boston Mass
A. P. Yutsis, and V. I. Kavetskis. Mar 66, 10p Rept no. T-R-594
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovskoi SSR, Vilna. Trudy. Seriya B, n1 (4) p9-16 1956, by David Kraus, and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Approximation (Mathematics)), Atomic spectroscopy, Atomic energy levels, Wave functions, Integrals, Beryllium, Boron, Carbon, Nitrogen, Oxygen, Fluorine, Neon, USSR.
Identifiers: Translations.

A new method is proposed for formulating an atomic wave function in the multiconfiguration approximation for equivalent electrons, whereby the individual two-electron component terms are described by a linear combination of two-electron wave functions corresponding to different two-electron configurations. The total energy is expressed through radial integrals for atomic species having the configurations 1s (2)2p (N) (N = 2, 3, 4, 5, and 6), with allowance for the configuration 1s (2)2s (2)2p (N-2). Numerical values of the correction to the energy for the two-configuration approximation and numerical values of the weight factor are given for N = 2, 3, and 4. These were obtained by means of analytic orbitals, whose constants were determined in the single-configuration approximation. (Author)
AD-669 199 HC$3.00 MF$0.65

THEORETICAL DETERMINATION OF THE ISOTOPE SHIFT IN THE SPECTRA OF HELIUM AND THE POSITIVE LITHIUM ION (O TEORETICHESKOM OPREDELENII IZOTOPICHESKOGO SMESHCHENIYA V SPEKTRE GELIYA I POLOZHITELNOGO IONA LITIYA),
American Meteorological Society Boston Mass
Ya. I. Vizbaraite, A. S. Nakonechnyi, and A. P. Yutsis. Apr 66, 18p Rept no. T-R-595
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk Litovoskoi SSR, Vilna. Trudy. Seriya B, n1 (9) p3-16 1957, by George E. Brady, and Stuart W. Kellogg.

Descriptors: (*Atomic orbitals, Line spectrum), (*Helium, Line spectrum), (*Lithium, Line spectrum), Atomic spectroscopy, Atomic energy levels, Configuration, Isotopes, Ground state, Excitation, USSR.
Identifiers: Fock self-consistent-field equations, Translations.

The multiconfiguration approximation is used to determine the specific effect of mass on the energy of the ground configuration of the helium atom and the positive lithium ion, while the effect is determined in a single-configuration approximation for the configurations lsnp (n=2,...,6) on the basis of orbitals of the Fock self-consistent field. The energy values of the isotope shift contributed by the mass effect are given for the isotopes of the helium atom of masses 4 and 3 and compare them with experimental data. The shift of a number of spectral lines for the isotopes of the helium atom of masses 4 and 3 and the isotopes of the positive lithium ion of masses 7 and 6 is determined with a rejection of the approximation of the one-electron-state model. The results obtained are compared with the results determined in an approximation of the one-electron-state model based on analytic orbitals, and with experimental data in cases where such data are available. (Author)
AD-669 200 HC$3.00 MF$0.65

MODE PULLING IN A STIMULATED RAMAN OSCILLATOR,
Massachusetts Inst of Tech Lexington Lincoln Lab
P. E. Tannenwald. 28 Jul 67, 4p Rept no. JA-3107
ESD-TR-68-48
Contract AF 19 (628)-5167
Availability: Published in Journal of Applied Physics, v38 n12 p4788-90 Nov 1967.

Descriptors: (*Raman spectroscopy, Quartz), (*Crystal oscillators, Raman spectroscopy), Lasers, Pumping (Optical), Ruby, Theory, Vibration.
Identifiers: Raman scattering, *Mode pulling theory.

Stimulated Raman scattering has been observed in quartz at low temperatures in which the 467/cm Stokes line is split into two or more sharp components. The quartz samples, which were in the form of resonant cavities, behaved as Raman oscillators pumped by a ruby laser. Measurement of the Fabry-Perot mode spacings of the oscillators showed that substantial mode pulling was occurring. This was interpreted according to mode-pulling theory. (Author)
AD-669 220 Not available from CFSTI.

CHEMICAL ISOLATION AND ANALYSIS OF METALLIC COMPOUNDS FORMED IN CERTAIN ALLOYS WITH NICKEL BASE,
General Dynamics/Astronautics San Diego Calif
P. B. Golubtsova, and L. A. Mashkovich. Aug 59, 11p Rept no. GDA-L-59-3-44
Trans. of Akademiya Nauk SSSR. Doklady, v106 n6 p1011-4 1956, by W. R. Eichler.

Descriptors: (*Nickel alloys, Chemical analysis), (*Intermetallic compounds, Chemical analysis), Phase studies, Titanium alloys, Chromium alloys, Aluminum alloys, Electrochemistry, USSR.
Identifiers: Translations.

The possibility of isolating the Ni3Ti phase in Ni-Ti, Ni-Cr-Ti, and Ni-Cr2O-SiO-Ti-Al systems was investigated. Particular attention was given to the establishment of the optimum composition of the electrolyte.
AD-669 233 HC$3.00 MF$0.65

EVALUATION OF THE X-RAY DIFFRACTION METHOD FOR DETERMINING VOLUME PERCENT OF RETAINED AUSTENITE IN CARBON STEEL.
Army Weapons Command Rock Island Ill Research and Engineering Div
For primary bibliographic entry see Field 11F.
AD-669 243 HC$3.00 MF$0.65

THE CHARGE MECHANISM IN FERROELECTRICS.
Ohio State Univ Research Foundation Columbus
For primary bibliographic entry see Field 20C.
AD-669 261 HC$3.00 MF$0.65

SPECTROSCOPY METHODS AND APPLICATION (SELECTED ARTICLES),
Foreign Technology Div Wright-Patterson AFB Ohio
S. S. Batsanov, G. N. Grigoreva, L. R. Batsanova, A. V. Korshunov, and L. S. Solovev. 3 Nov 67, 12p Rept no. FTD-HT-23-882-67
Edited trans. of mono. Spektroskopiya, Metody i Primenenie, Moscow, 1964 p128-30, 143-5, by E. Harter.

Descriptors: (*Rare earth compounds, Spectroscopy), (*Infrared spectroscopy, Phase studies), Rare earths, Fluorides, Band spectrum, Crystal structure, Anisotropy, Phenols, Phenyl ethers, Polycyclic compounds, Gases, Liquids, Crystals, USSR.
Identifiers: Translations.

Contents: Optical study of fluorides and oxides of rare earth metals; Infrared absorption spectra of some substances in different states of aggregation.
AD-669 275 HC$3.00 MF$0.65

KINETICS OF THE Hg (I)/Hg ELECTRODE WITH CONSIDERATION OF SPECIFIC ADSORPTION.
Technical rept.,
New York Univ N Y Dept of Chemistry
D. J. Kooijman. May 68, 18p Rept no. TR-9
Contract Nonr-285 (65)
Availability: To be published in Journal of Electroanalytical and Interfacial Electrochemistry.

Descriptors: (*Mercury, Electrodes), (*Electrodes, Reaction kinetics), Adsorption, Electrical double layer, Computer programs, Capacitance, Electrochemistry.
Identifiers: Electrode kinetics.

The kinetics of the Hg (I)/Hg electrode reaction in 1M HClO4 are reexamined with the galvanostatic and coulostatic pulse methods. Results interpreted on the basis of coupling between double layer charging and faradaic charge transfer. Such a coupling is clearly established. Adsorption of mercurous ions is tentatively explained by a linear adsorption isotherm. (Author)
AD-669 278 Not available from CFSTI.

COMPUTER PROGRAM FOR THE ERROR FUNCTION OF COMPLEX ARGUMENT.
Technical rept.,
New York Univ N Y Dept of Chemistry
D. J. Kooijman. May 68, 10p Rept no. TR-10
Contract Nonr-285 (65)
Availability: To be published in Journal of Electroanalytical and Interfacial Electrochemistry.

Descriptors: (*Electrodes, Computer programs), Electrical double layer, Diffusion, Reaction kinetics, Subroutines, Electrochemistry.
Identifiers: Electrode kinetics.

A FORTRAN IV subroutine was prepared for computation of the error function complement of complex arguments. Values are within 0.000004. This subroutine is suitable for computer analysis of electrochemical relaxation methods. (Author)
AD-669 279 Not available from CFSTI.

TECHNICAL REPORT 1967.
Rept. for 1 Jan-31 Dec 67,
Chicago Univ Ill Lab of Molecular Structure and Spectra
Robert S. Mulliken, and Clemens C. J. Roothaan. 31 Dec 67, 272p
Contracts N00014-67-A-0285, DA-31-124-ARO (D)-447
Research supported in part by Air Force.

Availability: Consists of 16 Articles pub. or to be pub. in various physics and chemistry journals.

Descriptors: (*Molecular orbitals, Approximation (Mathematics)), Field theory, Carbon, Hartree-Fock approximation, Algorithms, Hydrogen, Ground state, Configuration, Dissociation, Molecular energy levels, Tables, Deuteron cross sections, Proton reactions, Gamma emission, Wave functions, Helium, Interactions, Chemical bonds, Diatomic molecules, Hydrides, Hydroxides, Thiols, Carbon compounds, Molecular spectroscopy, Complex compounds, Molecular association, Ethylenes.

Contents: Multi-configuration self-consistent-field theory, Prog. Theor. Phys. (Kyoto) v40 p37 1967; An iterative quadratically convergent algorithm for solving the general Hartree-Fock-Roothaan equations, J. Chem. Phys. v47 p3253 1967; Confirmation of the discrepancy between the theoretical and experimental ground state energies of H2, Phys. Rev. Letters v20 p243 1968; Improved theoretical ground state energy of the hydrogen molecule, J. Chem. Phys. (to be published 1968); Vibrational and rotational energies for the B (1)Sigma-u (+), C (1)Pi-u, and a (3)Sigma-g (+) states of the hydrogen molecule, J. Chem. Phys. (to be published 1968); S-wave cross section for D (p, gamma)He (3), Phys. Rev. v165 p165 1968; The He-He interaction in the SGF-MO approximation, J. Chem. Phys. (to be published 1968); Molecular charge distributions and chemical binding, I, Homonuclear diatomic molecules, J. Chem. Phys. v46 p3341 1967; Molecular charge distributions and chemical binding, II, First-row diatomic hydrides, AH, J. Chem. Phys. v47 p3381 1967; Hartree-Fock wavefunctions, potential curves, and molecular properties for OH (-) ((1)Sigma (+)) and SH (-) ((1)Sigma (+)), J. Chem. Phys. v47 p2390 1967; The electron affinity of the diatomic hydrides, CH, NH, SiH and PH, Proc. Phys. Soc. (London) v91 p842 1967; Study of CH (-)3 and OH (+)3 by one-center expansion self-consistent-field method, J. Chem. Phys. v47 p2793 1967.
AD-669 285 Not available from CFSTI.

AN ESR STUDY OF THE NATURE OF THE SURFACE OXYGEN DURING THE OXIDATION OF A NONSTOICHIOMETRIC RUTILE SURFACE WITH OXIDES OF NITROGEN.
Revised ed.,
Frankford Arsenal Philadelphia Pa Pitman-Dunn Research Labs
R. D. Iyengar, M. Codell, and J. Tuekevich. 27 Sep 67, 9p
FA-A67-20
Revision of report dated 15 Aug 67.
Availability: Published in Journal of Catalysis, v9 p305-12 Nov 1967.

Descriptors: (*Nitrogen oxides, *Catalysis), (*Rutile, Oxidation), Chemisorption, Dissociation, Titanium compounds, Dioxides, Surface properties, Electron spin resonance.
Identifiers: Surface chemistry.

Nitrogen dioxide is known to undergo dissociative chemisorption with oxygen deficient rutile surfaces. An electron spin resonance study of nonstoichiometric rutile has shown that the oxygen deficiency is restored through interaction with either oxygen or nitrogen dioxide. When nonstoichiometric rutile is oxidized with oxygen, an O2 (-) species is produced, however, this species is not produced with nitrogen dioxide. This confirms the fact that a O2 furnished only atomic oxygen to the surface. An O2 (+) species is produced when oxygen deficient rutile is treated with either oxygen or nitrogen dioxide. This suggests that dissociative chemisorption rather than molecular oxygen is responsible for the formation of the O2 (+) species. (Author)
AD-669 295 Not available from CFSTI.

PURITY-PROPERTY RELATIONSHIPS IN ORGANIC SEMICONDUCTION.
Monsanto Research Corp Everett Mass Boston Lab
For primary bibliographic entry see Field 20L.
AD-669 352 HC$3.00 MF$0.65

TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE. SUPPLEMENT IV.
Final rept., Dec 66-Dec 67,
Aerospace Research Labs Wright-Patterson AFB Ohio
T. K. Krueger, W. L. McDavid, and S. J. Czyzak. Feb 68, 442p* Rept no. ARL-68-0026
See also AD-614 428, AD-631 938, AD-631 601, and AD-651 072.

Descriptors: (*Wave functions, Tables), (*Atomic energy levels, *Hartree-Fock approximation), Atomic spectroscopy, Astrophysics, Line spectrum, Electron transitions, Atoms, Ions, Atomic orbitals.

A table is presented of the Hartree-Fock wave functions for various atoms and ions mainly of astrophysical interest having atomic numbers ranging from 13 to 86. Also included in the table are the one-electron energy parameters and the relativistic and spin-orbit energy corrections. (Author)
AD-669 355 HC$3.00 MF$0.65

THERMODYNAMIC PROPERTIES OF ORGANIC DERIVATIVES OF THE LIGHTER ELEMENTS.
Annual technical summary rept. 1 Mar 67-1 Mar 68,
Bureau of Mines Bartlesville Okla Petroleum Research Center
Donald R. Douslin, William D. Good, Herman L. Finke, Roland H. Harrison, and George B. Guthrie. 1 Mar 68, 30p
AFOSR-68-0984

Descriptors: (*Organic nitrogen compounds, *Thermochemistry), (*Halogenated hydrocarbons, Thermochemistry), Imines, Amines, Ethylenediamine, Fluorine compounds, Enthalpy, Entropy, Heat of formation, Heat of combustion, Chemical bonds, Phase studies, Vapor pressure, Heat of vaporization, Fuels.
Identifiers: Ethylene imines, Propane diamines, Butane diamines, Isobutane diamines, Hexafluoro ethanes, Hexafluoro benzenes.

Continued thermochemical research was carried out on ethylenimine as a substance which showed high ring strain and as the parent compound of possible derivatives containing the ethylenimine ring which might show promise as high energy fuels. Programs of thermochemical research on aliphatic diamines were continued in order to better define the C-N thermochemical bond energy. Determinations of the state properties of the fluorocarbons were continued as a means for deriving their intermolecular energies. Results for ethylenimine include: thermodynamic functions in the ideal gas state to 1500K calculated from spectroscopic parameters; vapor pressure measurements; and derived enthalpies of vaporization. Research on the aliphatic diamines included enthalpies of combustion and formation, the C-N thermochemical bond energy, low-temperature heat capacities, third-law entropies, vapor pressures, and enthalpies of vaporization. Research on the state properties and intermolecular energies of fluorine compounds includes correlated values of the vapor pressure of hexafluorobenzene up to the critical, second and third virial coefficients of hexafluoroethane, and reduction of the P-V-T values for hexafluoroethane to standard data forms. (Author)
AD-669 369 HC$3.00 MF$0.65

STUDY OF EMISSION SPECTRA BY PHASE-DISCRIMINATION METHODS.
Final rept. 1 Feb 65-31 Jan 68,
Ohio State Univ Research Foundation Columbus
Fred P. Dickey, William H. Rogge, Herman E. Scott, John R. Yane, and John T. White. Apr 68, 63p
AFCRL-68-0247
Contract AF 19 (628)-4331

Descriptors: (*Infrared spectroscopy, Emissivity), Free radicals, Hydroxides, Band spectrum, Electron transitions, Argon, Gas lasers, Flames, Cyanides, Molecular energy levels, Excitation, Microwave frequency, Carbon dioxide.

A detailed report is given of the analysis of the emission spectrum of the OH radical in the regions of the fundamental and first overtone vibration-rotation bands. The observations were made with a high-resolution prism-grating vacuum spectrometer. Reports are also included on work completed on pulsed argon lasers, the emission spectrum of CN obtained by using microwave excitation, and the results of experiments carried out with a selective-frequency CO2 laser. (Author)
AD-669 381 HC$3.00 MF$0.65

PROPERTIES OF GAS LASERS.
Hawaii Univ Honolulu Dept of Physics and Astronomy
For primary bibliographic entry see Field 20H.
AD-669 389 HC$3.00 MF$0.65

A THEORETICAL TREATMENT OF MIXED SMOKES AS ICE NUCLEI,
Naval Ammunition Depot Crane Ind
For primary bibliographic entry see Field 4B.
AD-669 435 HC$3.00 MF$0.65

INSTRUMENTATION FOR TIME-RESOLVED MASS SPECTROMETRY APPLICATION TO LASER-VAPORIZATION OF SOLID MATERIALS,
Naval Radiological Defense Lab San Francisco Calif
For primary bibliographic entry see Field 14B.
AD-669 453 HC$3.00 MF$0.65

ENVIRONMENTAL FACTORS AFFECTING THE PERFORMANCE OF INFRARED CO2 ANALYZER AND THE ESTIMATION OF ALVEOLAR CO2 TENSION.
Army-Navy Joint rept.,
Naval Aerospace Medical Inst Pensacola Fla
Pei Chin Tang. 21 Mar 68, 27p Rept no. NAMI-1034
USAARU-68-8

Descriptors: (*Gas analysis, *Infrared spectroscopy), Carbon dioxide, Environmental tests, Water vapor, Barometric pressure, Temperature, Performance (Engineering), Sampling, Gases, Mixtures, Mathematical analysis, Theory.

Theoretical equations were derived from known physico-chemical laws to determine the effects of room temperature and barometric pressure on the performance of the infrared type of CO2 analyzer. They were first tested experimentally and then against empirical equations derived from the Godart nomogram. These equations were found to be valid and useful in the estimation of the fractional concentration of CO2 of gas mixtures under various environmental conditions. Minimal gas temperature recorded with a thermistor probe at the inlet of the analyzer was used to estimate the water vapor pressure of gas samples in the analyzer chamber. This method was experimentally tested to be valid in estimating CO2 fractional concentrations of heated wet gas mixtures. It was used to estimate the alveolar CO2 tension of human subjects with various end-tidal sampling methods. Methods used by others with this type of analyzer were discussed. (Author)
AD-669 458 HC$3.00 MF$0.65

DEVELOPMENT OF A SUPERSONIC NOZZLE MOLECULAR BEAM FACILITY,

California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
For primary bibliographic entry see Field 14B.
AD-669 490 HC$3.00 MF$0.65

TEMPERATURE DEPENDENCE OF F CENTER ABSORPTION IN KBr AND NaBr.
University of Western Ontario London Dept of Chemistry
For primary bibliographic entry see Field 20L.
AD-669 494 HC$3.00 MF$0.65

RAMAN SPECTRA OF POLYCRYSTALLINE H2S AND D2S.
Technical rept.,
Michigan State Univ East Lansing
R. E. Miller, and G. E. Leroi. May 68, 28p Rept no. TR-3 (28)
Contract N00014-68-A-0109
Submitted for publication in Journal of Chemical Physics.

Descriptors: (*Sulfides, *Raman spectroscopy), Deuterated compounds, Hydrogen compounds, Crystals, Solidified gases, Molecular energy levels, Excitation, Coherent radiation, Crystal structure, Phase studies.
Identifiers: *Hydrogen sulfide.

The Raman spectra of H2S and D2S were obtained in all three solid modifications, using both conventional and laser excitation. The spectra in the two higher temperature phases are consistent with their known disordered crystal structures. Previously undetected vibrational structure also has been obtained for both the internal and lattice vibrations in the lowest temperature phase (III); an assignment of the entire spectrum is proposed. Conclusions about the crystal structure of this phase, which has not been previously established, can be drawn from the combined results of x-ray, electron diffraction, infrared, far-infrared, and Raman investigations. It is shown that a C4h structure with 8 molecules per unit cell on C1 sites fits all the data for Phase III of H2S and D2S. (Author)
AD-669 501 HC$3.00 MF$0.65

A STUDY OF THE INTERACTIONS BETWEEN IONS IN SOLIDS.
Chicago Univ Ill James Franck Inst
For primary bibliographic entry see Field 20L.
AD-669 502 HC$3.00 MF$0.65

LIGHT SCATTERING BY SPHEROIDAL PARTICLES ORIENTED BY STREAMING.
Technical rept.,
Wayne State Univ Detroit Mich Dept of Chemistry
A. F. Stevenson. 20 May 68, 23p Rept no. TR-17 (63)
Contract Nonr-3511 (00)
Availability: To be published in Journal of Chemical Physics.

Descriptors: (*Colloids, *Optical analysis), Particles, Polarization, Fluid flow, Light, Scattering, Spheres.

Formulas are given for the intensity of light scattered by spheroidal particles which are partially oriented by streaming, as in a concentric cylinder apparatus. The calculation uses a general theory of scattering which is based on an expansion in inverse powers of the wavelength, and the theory of streaming alignment developed by Peterlin and Stuart and by Scheraga, Edsall and Gadd. Different polarizations of the incident wave are taken into account. Numerical calculations have been made for a number of values of the relevant parameters, the results of which are illustrated by a series of graphs. The results should be accurate to within at least five percent if the ratio (pi x longest dimension)/ (wavelength) does not exceed 0.8 and the relative refractive index does not exceed 1.20. (Author)
AD-669 503 Not available from CFSTI.

INVESTIGATION OF STIMULATED RAMAN SCATTERING.
Minnesota Univ Minneapolis Dept of Electrical Engineering
For primary bibliographic entry see Field 20F.
AD-669 504 HC$3.00 MF$0.65

POLARIZATION OF LYMAN-ALPHA RADIATION FROM H (+)- AND D (+)-RARE-GAS CHARGE-TRANSFER COLLISIONS,
Washington Univ Seattle Dept of Physics
T. D. Gaily, D. H. Jaecks, and R. Geballe. 1967, 9p
Partially supported by Army Research Office, Durham, N. C., and Office of Naval Research, Washington, D. C.
Availability: Published in The Physical Review, v167 n1 p81-9 Mar 5 1968.

Descriptors: (*Helium group gases, *Ion bombardment), Protons, Deuterons, Interactions, Line spectrum, Probability, Atomic energy levels, Emissivity, Polarization.
Identifiers: Charge-transfer reactions.

An experimental determination of the polarization of Lyman-alpha radiation arising from charge-transfer collisions involving energetic protons and deuterons incident on rare-gas atoms has been made in an energy range from 0.5 to 15 keV proton energy. The polarization was computed from the angular distribution of the emitted radiation with respect to the incident projectile direction. Corrections are made to earlier determinations of the product cross sections for the collisions. The cross sections are resolved into contributions from magnetic substrates, and the qualitative behavior of these contributions is discussed. (Author)
AD-669 535 Not available from CFSTI.

ATOMIC MASSES OF Fe56 AND Fe57,
Minnesota Univ Minneapolis School of Physics and Astronomy
Marshall C. Hudson, and Walter H. Johnson, Jr. 20 Mar 68, 3p
Contract Nonr-710 (58)
Availability: Published in The Physical Review, v167, n4 p1064-6 20 Mar 1968.

Descriptors: (*Iron, *Mass spectrum), Stable isotopes, Atomic properties, Deuteron bombardment, Proton capture.
Identifiers: Mass.

The 16-in. double-focusing mass spectrometer has been employed to remeasure the atomic masses of Fe56 and Fe57 in order to study a disagreement between earlier mass-spectroscopic results and nuclear reaction Q values. The results were found to agree well with the nuclear reaction Q values. A test of the Einstein mass-energy relationship was made using the measured Fe57-Fe56 isotopic difference and the Fe56 (d,p)Fe57 reaction Q value. The mass-energy relationship was substantiated to an accuracy of 0.12%. (Author)
AD-669 545 Not available from CFSTI.

DETERMINATION OF TRANSIENT GAS CONSTITUENT CONCENTRATIONS UTILIZING A HIGH ENERGY ELECTRON BEAM.
Arnold Engineering Development Center Arnold Air Force Station Tenn
For primary bibliographic entry see Field 14B.
AD-669 564 HC$3.00 MF$0.65

A CENTER OF COMPETENCE IN SOLID STATE MATERIALS AND DEVICES,
Florida Univ Gainesville Coll of Engineering
For primary bibliographic entry see Field 20L.
AD-669 580 HC$3.00 MF$0.65

STUDIES OF NITRIC OXIDE CHEMILUMINESCENCE USING BOUNDARY LAYER APPROXIMATIONS.
Mithras Cambridge Mass
For primary bibliographic entry see Field 20D.
AD-669 582 HC$3.00 MF$0.65

ENVIRONMENTAL EFFECTS ON PHOSPHORESCENCE. III. OXYGEN QUENCHING OF NAPHTHALENE TRIPLETS IN COMPRESSED PMMA.
California Univ Santa Barbara Dept of Chemistry
For primary bibliographic entry see Field 7E.
AD-669 626 Not available from CFSTI.

TRANSFORMATION PLASTICITY OF COBALT-NICKEL SINGLE CRYSTALS,
Illinois Univ Urbana Dept of Mining Metallurgy and Petroleum Engineering
For primary bibliographic entry see Field 20B.
AD-669 629 HC$3.00 MF$0.65

DELAYED COINCIDENCE-MOSSBAUER STUDIES OF SOLID STATE PHENOMENA.
Boston Univ Mass
For primary bibliographic entry see Field 20L.
AD-669 631 HC$3.00 MF$0.65

NUMERICAL TECHNIQUES IN MATRIX MECHANICS,
California Univ Berkeley Dept of Physics
For primary bibliographic entry see Field 20J.
AD-669 643 Not available from CFSTI.

SURFACE RECOMBINATION EFFICIENCIES IN FLOWS CONTAINING STEP-FUNCTION INCREASES IN ATOMIC OXYGEN.
Final technical rept.,
Cornell Aeronautical Lab Inc Buffalo N Y
Albert L. Myerson. Mar 68, 47p Rept no. CAL-AF-2033-A-1
AFOSR-68-0893
Contract AF 49 (638)-1487

Descriptors: (*Recombination reactions, *Gas flow), Reaction kinetics, Surface properties, Efficiency, Oxygen, Oxidation, Atoms, Stagnation point, Reynolds number, Heat transfer, Aluminum, Gold, Interactions, Argon, Silver, Copper, Iron, Nickel.
Identifiers: Surface chemistry, Gas-surface interactions.

A study was made of the initial interaction of atomic oxygen with various metals in steady flows which provide a step-function increase, or pulse, in the atom concentration. The observations were made by means of thin-film resistance thermometry. The results are presented under three categories as follows: surface recombination efficiencies, atom concentrations, and recombination heat transfer rate. (Author)
AD-669 655 HC$3.00 MF$0.65

MICROWAVE SPECTRA AND STRUCTURES OF ISOTHIAZOLE, 1,2,4-OXADIAZOLE AND IMIDAZOLE,
University Coll of North Wales Bangor Dept of Chemistry
For primary bibliographic entry see Field 7C.
AD-669 657 Not available from CFSTI.

SEQUENTIAL DECAY THEORY AND SEQUENTIAL TRANSITIONS,
California Univ Berkeley Dept of Physics
Lyman Mower. 27 Mar 68, 15p
AFOSR-68-1058
Grant AF-AFOSR-130-66
Availability: Published in The Physical Review, v165 n1 p145-57 5 January 1968.

Descriptors: (*Atomic energy levels, Theory), Electron transitions, Atomic spectroscopy, Alge-

bras, Fluorescence, Excitation, Relaxation time, Green's function.

A theory of sequential decay of an unstable system is presented using the projection-operator algebra suggested by the recent projection-operator approach to reaction theory. The formulation is an attempt to provide an alternative to perturbation theory. While exact, the theory is cast in a phenomenological form that is suggestive in its interpretation and may be extended so as to apply to sequential transitions in general. Examples treated include the transition between unstable states of an atom induced by an intense electromagnetic field as well as a problem in resonance fluorescence. Higher-order corrections to the more familiar theory are a natural consequence of the description of sequential decay and sequential transitions presented here. (Author)
AD-669 659 Not available from CFSTI.

EXCITATION OF THE 4F STATES OF HELIUM.
Interim rept.,
Oklahoma Univ Norman Dept of Physics
John D. Jobe, and Robert M. St. John. 21 Apr 68, 5p
AFOSR-68-1063
Grant AF-AFOSR-252-67
Availability: Published in Journal of the Optical Society of America, v57 n12 p449-51 1967.

Descriptors: (*Helium, *Atomic energy levels), Spectra (Infrared), Emissivity, Atomic spectroscopy, Excitation, Probability.

Recent studies of the population processes of the 4F state in helium by observation of the infrared radiation from this state have given direct experimental evidence for the 41P to 4F excitation-transfer process. The behavior of the apparent cross sections of the 41P and 4F states with pressure is used to evaluate the cross section for the excitation transfer and the cross section for electronic excitation to the 4F state. Apparent cross sections of the 4F state are presented at high and low pressures from onset to 450 eV. A high pressure the apparent cross section is similar to that of the 41P state. As the pressure is lowered, the shape of the excitation function approaches that of a 1D state. (Author)
AD-669 662 Not available from CFSTI.

SIMPLE AMO FUNCTION FOR THE LITHIUM MOLECULE,
Uppsala Univ (Sweden) Quantum Chemistry Group
D. K. Rai, and J. L. Calais. 1967, 9p
AFOSR-68-1069
Contract AF 61 (052)-874
Availability: Published in The Journal of Chemical Physics, v47 n3 p906-11 Aug 1 1967.

Descriptors: (*Lithium, *Molecular orbitals), Molecular spectroscopy, Diatomic molecules, Ground state, Wave functions, Potential energy, Numerical analysis, Sweden.

An AMO calculation for the ground state of the Li2 molecule is described. The calculations are very simple, but quite satisfactory results are obtained. Connections with other calculations are pointed out and certain interesting problems connected with the Li2 molecule and related molecules for which the AMO method might be useful, are discussed. (Author)
AD-669 672 Not available from CFSTI.

AN ANALYSIS OF THE 6250-A BAND SYSTEM OF Cs2.
Interim rept.,
Columbia Radiation Lab New York
P. Kusch, and M. M. Hessel. Feb 68, 20p
Contract N00014-67-A-0108, Grant AF-AFOSR-330-66
Research supported in part by Contract DA-28-043-AMC-00099 (E).
Availability: Published in Journal of Molecular Spectroscopy, v25 n2 p205-23 1968.

Descriptors: (*Cesium, *Molecular spectroscopy), Band spectrum, Spectra (Visible + ultraviolet), Tables.

A detailed analysis of the band system of molecular cesium at 6250A is reported. The system contains band heads degraded to the red and others degraded to the blue but no resolved rotational structure. It is shown that three red-degraded and one blue-degraded head may occur for most of the vibrational transitions. The highly variable shift of the red-degraded heads from the band origin, approximated by the blue-degraded head, allows the determination of certain combinations of rotational constants. If an assumption is made for both B and D of the ground state, a set of rotational and vibrational constants may be derived that represent the frequencies of both the red- and blue-degraded heads to a high accuracy. (Author)
AD-669 679 Not available from CFSTI.

RECENT MEASUREMENTS OF THE THERMAL CONDUCTIVITY OF LIQUID ANHYDROUS HYDROGEN CHLORIDE,
Explosives Research and Development Establishment Waltham Abbey (England)
H. Ziebland, and D. P. Needham. 4 Jan 68, 24p
Rept no. ERDE-27/R/67

Descriptors: (*Hydrochloric acid, Thermal conductivity), Pressure, Density, Temperature, Equations of state, Tables, Great Britain.

The thermal conductivity of anhydrous hydrogen chloride was studied in a precision coaxial cylinder apparatus at temperatures between -75 and +65C, and pressures from 40 to 100 bar. The experimental results were correlated by means of the unique relationship between the density of a fluid and its thermal conductivity. A simple third order polynomial expression between these quantities was derived which not only satisfactorily correlated the experimental results, but may also be used for the prediction of the thermal conductivity over a limited range of density outside that covered by the experiments. Information derived from this investigation is summarized in three diagrams showing, respectively, the isotherms and isobars of the thermal conductivity, and the relation between the density and the thermal conductivity. Smoothed values of the thermal conductivity at integral values of pressure and temperature are presented in a table and are compared with previously published data derived from an application of the corresponding state principle. (Author)
AD-669 683 HC$3.00 MF$0.65

CATALYTIC PROPERTIES OF SEMICONDUCTORS.
Massachusetts Inst of Tech Cambridge Dept of Chemical Engineering
For primary bibliographic entry see Field 7A.
AD-669 691 HC$3.00 MF$0.65

KINETIC STUDY OF THE REDUCTION OF NbCl5 BY NIOBIUM METAL USING A GAS CHROMATOGRAPH.
Ames Lab., Iowa.
D. J. Lorine, and F. D. Stevenson. Feb 68, 17p
Contract W-7405-eng-82

Descriptors: (*Niobium compounds, Reduction (Chemistry)), Chlorides, Reaction kinetics, Niobium, Gas chromatography.
Identifiers: Niobium chlorides.

For abstract, see NSA 22 10.
IS-1780 HC$3.00 MF$0.65

TRIPLE POINT DEPRESSION CURVES FOR THE BINARY SYSTEMS TUNGSTEN HEXAFLUORIDE IN URANIUM HEXAFLUORIDE AND MOLYBDENUM HEXAFLUORIDE IN URANIUM HEXAFLUORIDE. THEIR APPLICATION TO METHODS OF ANALYSES,
Oak Ridge Gaseous Diffusion Plant, Tenn.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 22 10.
K-1697 HC$3.00 MF$0.65

MOLYBDENUM HEXAFLUORIDE-HYDROGEN FLUORIDE TRIPLE POINT CURVE AND ITS APPLICATION TO A METHOD OF ANALYSIS,
Oak Ridge Gaseous Diffusion Plant, Tenn.
W. D. Hedge. 22 Mar 68, 22p
Contract W-7405-eng-26

Descriptors: (*Molybdenum compounds, Phase studies), Fluorides, Hydrogen compounds, Solutions, Chemical analysis.
Identifiers: Molybdenum hexafluoride, Hydrogen fluoride.

For abstract, see NSA 22 10.
K-1698 HC$3.00 MF$0.65

X-RAY SCATTERING FACTORS COMPUTED FROM NUMERICAL HARTREE-FOCK WAVE FUNCTIONS,
Los Alamos Scientific Lab., N. Mex.
Don T. Cromer, and Joseph B. Mann. 20 Dec 67, 69p*
Contract W-7405-eng-36

Descriptors: (*Atomic orbitals, *Hartree-Fock approximation), (*X rays, *Wave functions), Scattering, Functions, Tables.

For abstract, see NSA 22 10.
LA-3816 HC$3.00 MF$0.65

TABLES OF MOLECULAR VIBRATIONAL FREQUENCIES. PART 3,
National Standard Reference Data System.
Takehiko Shimanouchi. Mar 68, 46p
Hard copy available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.30.

Descriptors: (*Molecular spectroscopy, Tables), Molecular properties, Vibration, Molecular energy levels, Spectra (Infrared), Raman spectroscopy, Microwave spectroscopy, Reviews, Japan.

A compilation of vibrational frequency data for selected molecules is being conducted at the University of Tokyo in cooperation with the National Standard Reference Data Program of the National Bureau of Standards as a part of an international effort to compile and evaluate physical and chemical data. This report, as a continuation of Part 1 published as NSRDS-NBS-6, and Part 2 published as NSRDS-NBS-11, contains fundamental vibrational frequencies of 54 molecules together with vibrational assignments, sources of data, brief comments, and citations of references. The procedures used for the preparation of tables are the same as given in Part 1. The fundamental frequencies are obtained mainly from the infrared and Raman spectra. When these are not available, other experimental data such as microwave results are taken into account. The selection of vibrational fundamentals from observed data is based upon careful studies of the spectral data and comprehensive mathematical analyses. The tables were designed to provide a concise summary needed for the computation of ideal gas thermodynamic properties. They may also provide a convenient source of information to those who require vibrational energy levels and related properties in molecular spectroscopy, analytical chemistry, and other fields of physics and chemistry. (Author)
NSRDS-NBS-17 HC$3.00 MF$0.65

CHEMICAL SPECIES AND CHEMICAL REACTIONS OF IMPORTANCE IN NONEQUILIBRIUM PERFORMANCE CALCULATIONS.
TRW Systems, Redondo Beach, Calif.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 06 12.
N68-22014 HC$3.00 MF$0.65

ELECTRONIC STRUCTURE OF CARBIDES AND NITRIDES OFACE-CENTERED CUBIC TRANSITION METALS OF THE NA CL TYPE.

Office National D Etudes Et de Recherches Aerospatiales, Paris (France).
For primary bibliographic entry see Field 20L.
For abstract, see STAR 06 12.
N68-22113 HC$3.00 MF$0.65

CALCULATED COLLISION INDUCED ABSORPTION SPECTRUM FOR HE- AR.
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
R. B. Bernstein, and D. A. Mc Quarrie. 1 Mar 68, 44p NASA-CR-94349, WIS-TCI-287
Grant NSG-275-62

Descriptors: *Absorption spectra, *Argon, *Helium, Dipole moments, Graphs (charts), Line spectra, Nonlinearity, Particle interactions, Scattering coefficients, Scattering cross sections.

For abstract, see STAR 06 12.
N68-22590 HC$3.00 MF$0.65

MASS SPECTRA AND PYROLYSIS OF SOME AROMATIC-FLUOROALIPHATIC COMPOUNDS.
Royal Aircraft Establishment, Farnborough (England).
J. L. Cotter. Oct 67, 14p RAE-TR-67251

Descriptors: *Aliphatic compounds, *Fluoro compounds, *Mass spectra, *Pyrolysis, Diphenyl compounds, Organic compounds, Polymer chemistry, Synthetic resins, Thermal stability.

For abstract, see STAR 06 12.
N68-22603 HC$3.00 MF$0.65

CELL FOR STUDYING ELECTRON-ADSORBED GAS INTERACTIONS.
Commissariat A L Energie Atomique, Saclay (France).
For primary bibliographic entry see Field 14B.
For abstract, see STAR 06 12.
N68-22684 HC$3.00 MF$0.65

FORMATION OF IONIZED EXCITED STATES FROM THE LOSS OF THE METASTABLE ELECTRON IN THE NOBLE GAS ATOMS.
Ohio State Univ., Columbus. Electroscience Lab.
S. H. Koozekanani. 19 Apr 68, 12p NASA-CR-94388, TR-1093-39
Grant NSG-74-60

Descriptors: *Gas ionization, *Rare gases, Electrons, Excitation, Metastable atoms, Scattering cross sections, Tables (data).

For abstract, see STAR 06 12.
N68-22686 HC$3.00 MF$0.65

DIRECT DETERMINATION OF ENTHALPIES OF SOLID PHASE REACTIONS BY IMMERSION METHOD.
Determination Directe des Enthalpies de Reaction en Phase Solide Par Une Methode de Plongee
Commissariat A L Energie Atomique, Saclay (France).
J. Elston, L. Eyraud, M. Richard, A. Roux, and M. Stevanovic. Nov 67, 25p CEA-R-3308
Lang- in French

Descriptors: *Enthalpy, *Heat of formation, *Solid phases, *Temperature measuring instruments, Heat of solution, Reaction kinetics, Thermal energy, Thermodynamics.

For abstract, see STAR 06 12.
N68-22761 HC$3.00 MF$0.65

X-RAY DIFFRACTION DATA ON THE SYSTEM WATER-AMMONIA AT 4 DEGREES C,
Oak Ridge National Lab., Tenn.
A. H. Narten. Mar 68, 53p
Contract W-7405-eng-26

Descriptors: (*Water, *X-ray diffraction analysis), (*Ammonia, X-ray diffraction analysis), Molecular association, Theory, Tables.

For abstract, see NSA 22 10.
ORNL-4221 HC$3.00 MF$0.65

FILTERING CRUCIBLE-REACTION VESSEL.
Saint Edward's Univ., Austin, Tex. Dept. of Chemistry.
For primary bibliographic entry see Field 14B.
PB-177 662 HC$3.00 MF$0.65

SOLUBILITY IN THE SYSTEM (NH4)2HPO4-(NH4)2SO4-H2SO4-H3PO4-H2O,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
Yu S. Mishchenko, and M. L. Chepelevetskii. 15 Mar 66, 14p TVA-4170
Trans. of Nauchnyi Institut po Udobreniyam i Insekto-fungisidam. Trudy (USSR) n208 p30-42 1965, tr. by Carol C. Parr.

Descriptors: (*Ammonium compounds, Solubility), (*Phosphates, Solubility), (*Sulfates, Solubility), Phase studies, Sulfuric acid, Phosphoric acids, Crystallization, Fertilizers, USSR.
Identifiers: Ammonium phosphates, Ammonium sulfate.

Data in the literature are interpreted and solubility diagram of the system (NH4)2HPO4-(NH4)2SO4-H2SO4-H3PO4-H2O, the 25C isotherm, is constructed. Lines of common crystallization of (NH4)2SO4 + (NH4)3H (SO4)2; (NH4)2SO4 + NH4H2PO4.NH4HSO4; (NH4)2SO4 + NH4H2PO4; (NH4)2SO4 + (NH4)2HPO4; (NH4)3H (SO4)2 + NH4HSO4; (NH4)3H (SO4)2 + NH4H2PO4.NH4HSO4; NH4H2PO4 + (NH4)2HPO4; and NH4H2PO4 + NH4H2PO4.NH4HSO4 are investigated. The solubility diagram of the system (NH4)2HPO4-(NH4)2SO4-H2SO4-H3PO4-H2O, the 50C isotherm, is constructed. (Author)
PB-178 090T HC$3.00 MF$0.65

SOLUBILITY OF AMMONIUM SULFATE IN THE PRESENCE OF SULFURIC AND PHOSPHORIC ACIDS AND ALSO AMMONIUM PHOSPHATES,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
Yu. S. Mishchenko, and M. L. Chepelevetskii. 10 May 66, 21p TVA-4182
Trans. of Nauchnyi Institut po Udobreniyam i Insekto-fungisidam. Trudy (USSR) n208 p16-30 1965, tr. by Carol C. Parr.

Descriptors: (*Ammonium compounds, Solubility), (*Phosphates, Solubility), (*Sulfates, Solubility), Phosphoric acids, Sulfuric acid, Phase studies, Salts, Crystallization, Fertilizers, USSR.
Identifiers: Ammonium phosphates, Ammonium sulfate.

Data were collected from the literature on systems occurring in the quaternary systems NH3-P2O5-SO3-H2O; The 50C isotherms of the following ternary systems were studied: (NH4)2SO4-H2SO4-H2O); (NH4)2SO4- (NH4)2HPO4-H2O); (NH4)2SO4-NH4H2PO4-H2O; (NH4)2SO4-H3PO4-H2O. The region of existence of the salt (NH4)3H (SO4)2 and the binary salt NH4H2PO4.NH4HSO4 was determined. The presence of the complex salt (NH4)8H2 (SO4)5 and mixed crystals of it with ammonium sulfate-bisulfate proposed by Locuty was not detected. Studies of the indicated ternary systems make it possible to proceed to a study of the four-component system NH3-P2O5-SO3-H2O in a wide range of concentrations. (Author)
PB-178 091T HC$3.00 MF$0.65

INVESTIGATION OF SPARINGLY SOLUBLE CRYSTALLINE PRECIPITATES. II. GYPSUM,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7B.
PB-178 092T HC$3.00 MF$0.65

SOLUBILITY IN SYSTEMS CONTAINING UREA AND AMMONIUM PHOSPHATES,
Tennessee Valley Authority, Oak Ridge, Wilson Dam, Ala.
G. L. Tudorovskaya, and F. G. Margolis. 27 Mar 67, 9p TVA-4228
Trans. of Khimicheskaya Promyshlennost (USSR) v42 n9 p678-80 1966, tr. by Carol C. Parr.

Descriptors: (*Ammonium compounds, Solubility), (*Phosphates, Solubility), (*Urea, Solubility), Phase studies, Nitrates, Hydrolysis, Crystallization, Fertilizers, USSR.
Identifiers: Ammonium phosphates.

Analysis of the solubility diagrams of the quaternary systems CO (NH2)2-NH4NO3-NH4H2PO4-H2O (I) and CO (NH2)2-NH4NO3- (NH4)2HPO4-H2O (II) results in several conclusions: (1) THE UREA AREA IS SYSTEM I in larger than in system II; (2) In system I there is decomposition of urea in the solutions as a result of hydrolysis in the presence of monoammonium phosphate, but in system II the decomposition of urea is not observed; (3) In the region of anhydrous melts in both systems the decomposition of urea is not observed, and the content of ammonium phosphates in the melts is negligible. (Author)
PB-178 098T HC$3.00 MF$0.65

PHOTOELECTROCHEMICAL STUDY OF ANODIC DISSOLUTION OF IRON,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
A. Sh. Valeev, and M. A. Chvala. 1 Sep 67, 7p TVA-P-4254
Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Khimicheskaya, n11 p1946-9 1965, tr. by William Hunn.

Descriptors: (*Iron, Electrochemistry), (*Photochemistry, Iron), Iron oxides, Semiconducting films, Surface properties, Photoelectric effect, Anodes (Electrolytic cell), Carriers (Semiconductors), USSR.
Identifiers: Photoelectrochemical effect, Oxide films, Surface chemistry.

A distinct connection between the rate of decay of the photoeffect and surface structural changes was established by the photoelectrochemical studies of anodic dissolution of iron: submicroscopic surface smoothing takes place during the onset of the very slowly decaying photoeffect. A hypothesis is drawn on the interdependence of submicroscopic surface smoothing and the surface formation of an oxide film of relaxing electron composition. (Author)
PB-178 100T HC$3.00 MF$0.65

CATALYTIC ACTIVITY OF PLATINIZED NICKEL IN RELATION TO OXIDATION OF SO2,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
O. K. Davtyan, E. N. Ovchinnikova, and G. A.Grigoreva. 11 Mar 68, 2p TVA-4320
Trans. of Nauchnyi Ezhegodnik (USSR) n2 p115-6 1961, tr. by William C. Hunn.

Descriptors: (*Platinum, *Catalysis), (*Sulfuric acid, Synthesis (Chemistry)), Sulfur compounds, Dioxides, Oxidation, Reaction kinetics, Catalysts, Nickel, Porous metals, Asbestos, USSR.
Identifiers: Sulfur dioxide, Catalyst supports.

It is known that the acitivity of platinum catalysts in relation to SO2 oxidation is quite strongly dependent upon the nature of the carrier. This dependence may be expressed quite sharply if one compares the platinum catalysts applied to a metal and to a dielectric or semiconductor. The article makes

a comparison of the activity of platinum catalyst in a porous nickel skeleton with the activity of platinized asbestos. (Author)
PB-178 110T HC$3.00 MF$0.65

NEUTRON ACTIVATION TECHNIQUES FOR MINERAL EXPLORATION.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see NSA 22 10.
TID-23668 HC$3.00 MF$0.65

SUMMARIES OF THE USAEC BASIC RESEARCH PROGRAM IN CHEMISTRY (OFF-SITE).
Division of Research (AEC), Washington, D. C.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 22 10.
TID-4005-Pt-2A-Ed-3 HC$3.00 MF$0.65

7E. Radio and Radiation Chemistry

PURITY-PROPERTY RELATIONSHIPS IN ORGANIC SEMICONDUCTION.
Monsanto Research Corp Everett Mass Boston Lab
For primary bibliographic entry see Field 20L.
AD-669 352 HC$3.00 MF$0.65

STUDIES OF NITRIC OXIDE CHEMILUMINESCENCE USING BOUNDARY LAYER APPROXIMATIONS.
Mithras Cambridge Mass
For primary bibliographic entry see Field 20D.
AD-669 582 HC$3.00 MF$0.65

ENVIRONMENTAL EFFECTS ON PHOSPHORESCENCE. III. OXYGEN QUENCHING OF NAPHTHALENE TRIPLETS IN COMPRESSED PMMA.
Technical rept.,
California Univ Santa Barbara Dept of Chemistry
B. A. Baldwin, and H. W. Offen. 10 May 68, 17p
Rept no. TR-11
Contract N00014-67-A-0120
See also AD-667 975.
Availability: To be published in Journal of Chemical Physics.

Descriptors: (*Naphthalenes, *Phosphorescence), Molecular energy levels, Quenching (Inhibition), Oxygen, Embedding substances, Acrylic resins, Pressure, Relaxation time.

Bimolecular, diffusion-controlled oxygen quenching shortens triplet lifetimes and reduces phosphorescence intensities of organic solutes embedded in polymethylmethacrylate at room temperature. Matrix compression reduces the quenching of naphtahlene and naphthalene-d8 triplets until at pressures of about 12 kbar the presence of oxygen is no longer felt and the pressure dependence of the lifetime in the 12 - 30 kbar range is indistinguishable from measurements on thoroughly deaerated samples. The activation volume for oxygen diffusion in this polymer is approximately +12 cu cm/mole, as measured from the phosphorescence lifetimes of naphthalene-d8. The high pressure results confirm that diffusional quenching is not responsible for the effects of pressure on phosphorescence lifetimes in deaerated polymer matrices. (Author)
AD-669 626 Not available from CFSTI.

TABLES FOR THE EVALUATION OF DECAY CURVES OF A CHEMICAL SPECIES UNDERGOING SIMULTANEOUS FIRST- AND SECOND-ORDER DECAY,
Argonne National Lab., Ill.
Klaus H. Schmidt. Dec 67, 17p*
Contract W-31-109-eng-38

Descriptors: (*Radiation chemistry, Reaction kinetics), (*Reaction kinetics, Tables), Excitation, Relaxation time.

For abstract, see NSA 22 10.
ANL-7400 HC$3.00 MF$0.65

DIBUTYL CARBITOL SOLVENT EXTRACTION OF POLONIUM-210 FROM NITRIC ACID SOLUTIONS OF IRRADIATED BISMUTH,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
W. W. Schulz, and G. L. Richardson. Feb 68, 58p
Contract AT (45-1)-1830

Descriptors: (*Polonium, Solvent extraction), Bismuth, Nitric acid, Organic solvents, Ethers.
Identifiers: Bis (Butoxyethyl) ethers.

For abstract, see NSA 22 10.
BNWL-584 HC$3.00 MF$0.65

DETERMINATION OF MICROGRAM QUANTITIES OF FLUORIDE IN METAL OXIDES,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
C. E. Plucinski. Mar 68, 12p
Contract AT (45-1)-1830

Descriptors: (*Fluorides, Microanalysis), (*Uranium compounds, Microanalysis), (*Plutonium compounds, Microanalysis), Oxides, Impurities, Reactor fuel elements.
Identifiers: Plutonium oxide, Uranium tritaoctoxide.

For abstract, see NSA 22 10.
BNWL-601 HC$3.00 MF$0.65

TRIPLE POINT DEPRESSION CURVES FOR THE BINARY SYSTEMS TUNGSTEN HEXAFLUORIDE IN URANIUM HEXAFLUORIDE AND MOLYBDENUM HEXAFLUORIDE IN URANIUM HEXAFLUORIDE. THEIR APPLICATION TO METHODS OF ANALYSES,
Oak Ridge Gaseous Diffusion Plant, Tenn.
W. D. Hedge. 22 Mar 68, 20p
Contract W-7405-eng-26

Descriptors: (*Uranium compounds, Phase studies), Fluorides, Tungsten compounds, Molybdenum compounds, Solutions, Chemical analysis.
Identifiers: Molybdenum hexafluoride, Tungsten hexafluoride, Uranium hexafluoride.

For abstract, see NSA 22 10.
K-1697 HC$3.00 MF$0.65

INVESTIGATION OF TWO METHODS FOR MEASURING FREE ACID IN PLUTONIUM SOLUTIONS,
Los Alamos Scientific Lab., N. Mex.
J. W. Dahlby, G. R. Waterbury, and C. F. Metz.
1 Dec 67, 8p
Contract W-7405-eng-36

Descriptors: (*Plutonium, Solutions), Reactor fuel processing, Hydrochloric acid, Nitric acid, Sulfuric acid, Chemical analysis.

For abstract, see NSA 22 10.
LA-3876 HC$3.00 MF$0.65

MOUND LABORATORY PROGRESS REPORT FOR CHEMISTRY, APRIL-JUNE 1967.
Mound Lab., Miamisburg, Ohio.
30 Jun 67, 36p
Contract AT (33-1)-GEN-53

Descriptors: (*Radiochemistry, Reviews), (*Radiation chemistry, Reviews), Radioactive isotopes, Chemical analysis.

For abstract, see NSA 22 10.
MLM-1417 HC$3.00 MF$0.65

STUDY OF PHOTOSENSITIZED DECOMPOSITION OF HYDROPEROXIDES FINAL REPORT.
Polytechnic Inst. of Brooklyn, N. Y.
G. Oster. 31 Jul 67, 127p NASA-CR-94252
Contract NGR-33-006-017

Descriptors: *Oxygen production, *Peroxides, *Photodecomposition, Chelates, Chlorophylls, Polymerization, Sensitizing, Tetrazoles, Vinyl polymers, Zinc oxides.

For abstract, see STAR 06 12.
N68-21933 HC$3.00 MF$0.65

COMPARISON OF CALCULATED RADIOCHEMICAL CROSS SECTIONS WITH EXPERIMENTAL RESULTS FOR INCIDENT PROTONS AND NEGATIVE PIONS IN THE 50 TO 400 MEV REGION - EFFECT OF VARYING A FEW NUCLEAR PARAMETERS IN THE CALCULATIONS.
Oak Ridge National Lab., Tenn.
H. W. Bertini. Apr 68, 59p NASA-CR-94309, ORNL-4105
Contract NASA ORDER 104/1/, W-4105-ENG-26

Descriptors: *Proton energy, *Reaction kinetics, Aluminum, Carbon, Copper, Evaporation, Particle interactions, Pions, Radiochemistry, Scattering cross sections, Uranium.

For abstract, see STAR 06 12.
N68-22150 HC$3.00 MF$0.65

EFFECTS OF GAMMA RADIATION ON CERTAIN SYNTHETIC LUBRICANTS.
European Space Research Lab., Noordwijk (Netherlands).
For primary bibliographic entry see Field 11H.
For abstract, see STAR 06 12.
N68-22162 HC$3.00 MF$0.65

PASSAGE OF HIGH ENERGY NEUTRONS IN IRON AQUEOUS MIXTURES.
Prokhozhdenie Neitronov Vysokikh Energii V Zhelezovodnykh Smesyakh
National Research Council of Canada, Ottawa (Ontario).
M. M. Komochkov, V. V. Malkov, B. S. Sychev, and L. N. Zaitseva. 1967, 15p NRC-TT-1278
Tran- Transl. Into English From the Publ. "ob". edinennogo Instituta Yadernykh Issledovanii" Dubna, Joint Inst. for Nucl. Res., 1965

Descriptors: *Flux (rate), *High energy interactions, *Iron, *Neutron spectra, *Protons, Attenuation, Shielding, Water.

For abstract, see STAR 06 12.
N68-22352 HC$3.00

ACTIVATION ANALYSIS USING GAMMA PHOTONS.
Analyse Par Activation Aux Photons Gamma
Commissariat A L Energie Atomique, Saclay (France).
C. Engelmann. Dec 67, 62p CEA-R-3307
Lang- in French

Descriptors: *Chemical analysis, *Gamma rays, *Photons, *Radiochemistry, Bremsstrahlung, Nuclear reactions, Radioactivity.

For abstract, see STAR 06 12.
N68-22903 HC$3.00 MF$0.65

KINETIC STUDY OF HEXAVALENT PLUTONIUM REDUCTION BY HYDROGEN PEROXIDE IN ACID SOLUTION.
Etude Cinetique de La Reduction Par le Peroxyde D Hydrogene Du Plutonium Hexavalent en Solution Acide

Commissariat A L Energie Atomique, Fontenay-Aux-roses (France).
B. Lesigne. Dec 67, 36p CEA-R-3168
Lang- in French

Descriptors: *Hydrogen peroxide, *Nitric acid, *Perchloric acid, *Plutonium, *Reaction kinetics, *Sulfuric acid, Acidity, Hydrolysis, Radiochemistry, Reduction (chemistry).

For abstract, see STAR 06 12.
N68-22904 HC$3.00 MF$0.65

STUDY OF HOMOMOLECULAR ISOTOPIC EXCHANGE REACTIONS ON METALLIC OXIDES.
Etude des Reactions D'echange Isotopique Homomoleculaire Sur les Oxydes Metalliques
Commissariat A L Energie Atomique, Saclay (France).
J.-C. Bailly. Dec 67, 22p CEA-BIB-104
Lang- in French, English Summary

Descriptors: *Chemical reactions, *Metal oxides, *Molecular interactions, *Reaction kinetics, Catalytic activity, Gas-metal interactions, Intermolecular forces, Oxygen atoms, Temperature effects.

For abstract, see STAR 06 12.
N68-23027 HC$3.00 MF$0.65

SOLVENT STABILITY IN NUCLEAR FUEL PROCESSING. EVALUATION OF THE LITERATURE, CALCULATION OF RADIATION DOSE, AND EFFECTS OF IODINE AND PLUTONIUM,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 22 10.
ORNL-4212 HC$3.00 MF$0.65

PHOTOELECTROCHEMICAL STUDY OF ANODIC DISSOLUTION OF IRON,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7D.
PB-178 100T HC$3.00 MF$0.65

APPARENT RATE CONSTANTS AND ACTIVATION ENERGIES FOR THE PHOTOCHEMICAL DECOMPOSITION OF VARIOUS OLEFINS,
Clemson Univ., S. C. Dept. of Chemical Engineering.
F. C. Alley, G. B. Martin, and W. H. Ponder. 1964, 18p
Grants PHS-AP00194-01, PHS-AP00194-02
Presented at the Annual Meeting of the Air Pollution Control Association (57th), Houston, Tex., Jun 64.

Descriptors: (*Alkenes, *Photochemistry), (*Waste gases, Photolysis), Reaction kinetics, Heat of activation, Hydrocarbons, Air pollution.
Identifiers: Butenes, Pentenes, Hexenes, Smog.

The photochemical decomposition of various olefins was studied in a bench scale reaction system. Olefin decomposition as carried out in this study could be approximated by three consecutive first order reactions. The temperature sensitivities of the three reactions were equivalent to activation energies in the 6 to 13 Kcal/gm mol range. The second phase apparent activation energy may prove useful in characterization of olefin reactivity and for this reason warrants additional study. (Author)
PB-178 113 HC$3.00 MF$0.65

SUMMARIES OF THE USAEC BASIC RESEARCH PROGRAM IN CHEMISTRY (OFF-SITE).
Division of Research (AEC), Washington, D. C.
Apr 68, 186p

Descriptors: (*Radiation chemistry, Reviews), (*Radiochemistry, Reviews), Photochemistry, Physical chemistry, Chemical analysis, Isotopes.

For abstract, see NSA 22 10.
TID-4005-Pt-2A-Ed-3 HC$3.00 MF$0.65

DETERMINATION OF RARE EARTHS AND FLUORIDES IN RARE EARTH FLUORIDES,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 7B.
For abstract, see NSA 22 10.
UCRL-50383 HC$3.00 MF$0.65

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

A COMPILATION OF ARTICLES REPORTING RESEARCH SPONSORED JOINTLY BY THE U. S. ATOMIC ENERGY COMMISSION AND THE OFFICE OF NAVAL RESEARCH.
Washington Univ Seattle Dept of Oceanography
For primary bibliographic entry see Field 8J.
AD-669 290 Not available from CFSTI.

REPRODUCTIVE PERIODICITIES OF MARINE ANIMALS OF TROPICAL MIDDLE EAST WATERS.
Final rept., 15 Jun 66-31 Dec 67,
American Univ Cairo (Egypt)
J. S. Pearse. Feb 68, 81p
Contract N62558-5022

Descriptors: (*Aquatic animals, Reproduction (Physiology)), Marine biology, Rhythm (Biology), Echinodermata, Mollusca, Crustacea, Periodic variations, Sea water, Temperature, Inland waterways, Red Sea, Middle East.
Identifiers: Suez Canal, Suez Gulf.

Circannian reproductive periodicities were followed in five wide-spread Indo-Pacific sea urchins in the Gulf of Suez area: Prionocidaris baculosa, Diadema setosum, Tripneustes gratilla, Echinometra mathaei and Lovenia elongata. Individual gametogenic cycles were similar in all species, and included a reciprocal relationship between the amount of nutritive tissue present and gametogenesis. E. mathaei spawned only during the summer (June-Sept.) within the Gulf of Suez, while it spawned throughout the year in the adjacent Red Sea. T. gratilla spawned during the winter (Nov.-Apr.) in the northern Red Sea. The other three species were summer spawners. There was little direct relation between the annual sea temperature fluctuations and the reproductive periodicities. Temperature fluctuations, however, probably did influence the nutrient buildup needed prior to the onset of gametogenesis. Reproductive activity also was examined in 11 other species in the Gulf of Suez area: Asterina burtoni and Linckia multifora (Asteroidea), Acanthopleura haddoni and Onithochiton erythraeus (Amphineura), Haliotis pustulata (Gastropoda), Tetrachthamalus oblitteratus (Cirripedia), and Athanas indicus, Petrolisthess rufescens and Pilumnopeus vauguelini (Malacostraca). The majority of the species within the Gulf of Suez spawned during the summer, while reproductive activity was more prolonged and tended to begin during mid-winter in the adjacent Red Sea. Slight differences in the maximum daily sea temperatures during the winter were thought to be responsible for these reproductive differences. (Author)
AD-669 506 HC$3.00 MF$0.65

WATER MASSES OF THE SEA OF OKHOTSK,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 8J.
JPRS-43942 HC$3.00 MF$0.65

8B. Cartography

RADIOMETRIC TRACKING OF SMALL ISLANDS.
Memorandum rept.,
Ballistic Research Labs Aberdeen Proving Ground Md
Kenneth A. Richer. Feb 68, 41p Rept no. BRL-MR-1912

Descriptors: (*Mapping, Scientific satellites), Stabilized platforms, Islands, Millimeter waves, Radiometers, Simulation, Calibration, Alignment, Spectrum signatures.
Identifiers: Graphs (Charts).

Radiometric measurements have been made at 35 GHz to simulate the tracking of a small island by a satellite-borne system. Both absolute temperature and tracking error measurements were made. The simulation was made using a portable tower to attain altitude and microwave absorbing material on a support in the water off Spesutie Island at Aberdeen Proving Ground as a target. It was concluded that with a 10 sec time constant, conical scan tracking with a 10 in. diameter antenna could achieve pointing accuracies of better than 5 mrad of angle if great care were taken to initially align and calibrate the mechanical, electrical, and spatial axes of the system. (Author)
AD-669 241 HC$3.00 MF$0.65

VARISCALE STEREO POINT MARKING INSTRUMENT.
Technical rept.,
Bausch and Lomb Inc Rochester N Y
Maurits Roos. Apr 68, 27p*
USAETL-39-TR
Contract DA-44-009-AMC-522 (X)

Descriptors: (*Photogrammetry, Instrumentation), Stereoscopic photography, Optical equipment, Punched cards, Test methods, Scale, Illumination, Resolution, Area coverage, Velocity, Accuracy, Alignment, Stability, Dies.
Identifiers: *Variscale stereo point marking instruments.

The report covers the engineer tests and evaluation of a stereo point marking instrument, an instrument for analytical triangulation to mark points and transfer these points on photographs with large changes in scale and format size. The instrument has a marking accuracy of better than 2 microns and has a high operating speed; also, it has flexibility with many ease-of-operation features because of the variable parameters of optics, marking dies, and sizes of photographs. (Author)
AD-669 257 HC$3.00 MF$0.65

AERONAUTICAL CHART AND INFORMATION CENTER TECHNICAL TRAINING ACTIVITIES.
Technical Paper,
Aeronautical Chart and Information Center St Louis Mo
Sidney E. Tischler. Mar 63, 11p Rept no. ACIC-Technical Paper-6

Descriptors: (*Mapping, Training), Professional personnel, Technical information centers, Education, Photogrammetry, Photometers, Quality control, Errors, Programming (Computers), Air traffic control systems, Plotting boards, Radar navigation, Mechanical drawing, Management engineering, Astronomical geodesics.

The technical training concepts, requirements, and procedures of the USAF aeronautical chart and information center are presented within the framework of a rapidly advancing technology. The paper emphasizes the importance of comprehensive planning for the initial academic training of the cartographer and for a continuing up-dating of his skills in order to maximize the advantages offered by technological improvements. (Author)
AD-669 421 HC$3.00 MF$0.65

Group 8B—Cartography

CONTOUR, A FORTRAN PROGRAM TO PRODUCE CONTOUR MAPS FROM A MATRIX.
Technical memo.,
Picatinny Arsenal Dover N J Data Processing Systems Office
Forrest McMains. Oct 67, 38p*
PA-TM-1796

Descriptors: (*Mapping, Computer programs), Optical scanning, Programming (Computers), Input-output devices, Curve fitting, Reading machines, Data processing systems, Subroutines, Logic circuits, Interpolation.
Identifiers: FORTRAN, Computer mapping techniques, Graphs (Charts), *CONTOUR computer program.

This memorandum describes a Fortran program for producing contour maps from matrix data. It has been written for use with the IBM 360-65 Computer and the Calcomp Plotter System. (Author)
AD-669 485 HC$3.00 MF$0.65

EXPERIMENTAL MAPPING FROM RANGER PHOTOGRAPHY FINAL REPORT.
Army Map Service, Washington, D. C.
Aug 66, 216p NASA-CR-92080
NASA ORDER T-43327/G/

Descriptors: *Lunar topography, *Photointerpretation, *Ranger project, *Stereophotography, Lunar orbiter, Mapping, Photographic equipment, Spaceborne photography.

For abstract, see STAR 06 12.
N68-22331 HC$3.00 MF$0.65

8C. Dynamic Oceanography

AN ANALYSIS OF JAPANESE CURRENT METER ARRAYS.
Informal rept.,
Naval Oceanographic Office Washington D C
J. D. Hawes. Apr 68, 13p Rept no. NOO-IR-68-12

Descriptors: (*Ocean currents, Meters), (*Oceanographic data, Japan), Operation, Maintenance, Phased arrays, Launching, Instrumentation, Mooring buoys, Surface-to-underwater, Anchors (Marine), Recovery, Effectiveness, Line throwing equipment, Cordage, Harbors.
Identifiers: Current meters.

Surveys for an oceanographic data exchange program are undertaken in the Japanese waters by the U. S. Naval Oceanographic Office (NAVOCEANO) and the Japanese Maritime Self Defense Forces (JMSDF). As part of this program, self-contained current meters are supplied to the Japanese. Although a brief course of instruction on the operation and maintenance of the current meters is conducted, the Japanese have the responsibility of constructing and launching the current meter arrays. A NAVOCEANO representative boarded a Japanese ship in July 1967 in response to a JMSDF invitation to observe current meter operations. This report discusses the Japanese techniques and compares them with present NAVOCEANO practices. Advantages and disadvantages of both techniques for launching, recovery, and rigging procedures are presented. (Author)
AD-669 436 HC$3.00 MF$0.65

MOORING MOTION,
Woods Hole Oceanographic Institution Mass
For primary bibliographic entry see Field 13J.
AD-669 456 HC$3.00 MF$0.65

CURRENT MEASUREMENTS FROM MOORED BUOYS, 1959-1965.
Summary rept.,
Woods Hole Oceanographic Institution Mass
N. P. Fofonoff. May 68, 39p Rept no. WHOI-Ref-68-30
Contracts Nonr-3351 (00), Nonr-2196 (00)

Descriptors: (*Ocean currents, Measurement), (*Mooring buoys, Ocean currents), Meters, Design, Periodic variations, Oceanographic equipment, Underwater communication systems, Anchors (Marine), Ocean bottom, Telemeter systems, Recording systems, Data processing systems.
Identifiers: *Current meters.

A review of the program for the development and use of moored buoys to measure currents during the period 1959-1965. The experiments, results, and problems encountered are described. (Author)
AD-669 457 HC$3.00 MF$0.65

OCEANOGRAPHIC THERMAL GRADIENT DISPLAY STUDY.
Technical rept.,
Futuronics Corp Port Washington N Y
Cyrus Adler. Sep 65, 77p
NAVTRADEVCEN-1519-1
Contract N61339-1519

Descriptors: (*Oceanology, Thermoclines), (*Thermoclines, Stereoscopic display systems), Education, Thermal properties, Oceanographic data, Feasibility studies, Electron beams, Optical instruments, Shallow water, Deep water, Portable, Underwater sound, Reflection, Electron tubes, Rotation, Schlieren photography, Simulation, Ultrasonic radiation.

This report describes a study of oceanographic thermal gradient display techniques. The intent of the study was to provide a suitable approach for the development of a three-dimensional classroom demonstrator that would adequately display various oceanographic thermal gradients associated with acoustical transmission. Two techniques, an electro-magnetic tube analog and an optical analog, were breadboarded. (Author)
AD-669 488 HC$3.00 MF$0.65

WATER MASSES OF THE SEA OF OKHOTSK,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 8J.
JPRS-43942 HC$3.00 MF$0.65

HYDROSTATIC SEA LEVEL CHANGES.
Massachusetts Inst. of Tech., Cambridge.
G. Welch. 1968, 6p NASA-CR-94354
Contract NGR-22-009-250

Descriptors: *Hydrostatics, *Oceanography, *Sea water, Atmospheric pressure, Atmospheric temperature, Barometers, Temperature profiles.

For abstract, see STAR 06 12.
N68-22769 HC$3.00 MF$0.65

8D. Geochemistry

A STUDY OF DYNAMICS OF MAGMA EXTRUSION AND INVESTIGATION OF VOLCANIC VAPOR FINAL REPORT, 25 MAR. 1966 - 30 JUN. 1967.
Little (Arthur D.), Inc., Cambridge, Mass.
R. V. Allen, L. A. Mc Claine, and R. K. Mc Connell, Jr., Jul 67, 196p NASA-CR-62060, C-68231
Contract NAS9-5839

Descriptors: *Dynamic models, *Heat transmission, *Magma, *Vapors, *Volcanology, Earth crust, Extruding, Geology, Igneous rocks, Lava.

For abstract, see STAR 06 12.
N68-22109 HC$3.00 MF$0.65

RESEARCH RELATING TO LUNAR STUDIES ANNUAL REPORT, 1 MAR, 1967 - 28 FEB. 1968.
Miami Univ., Coral Gables, Fla. Inst. of Molecular Evolution.
28 Feb 68, 14p NASA-CR-94423
Contract NGR-10-007-044

Descriptors: *Chemical analysis, *Lunar soil, *Meteoritic composition, *Volcanology, Amino acids, Carbonaceous rocks, Geochemistry, Paleontology.

For abstract, see STAR 06 12.
N68-22773 HC$3.00 MF$0.65

8E. Geodesy

A GRAVITY SURVEY OF THE CHUKCHI SEA REGION, AND ITS BEARING ON WESTWARD EXTENSION OF STRUCTURES IN NORTHERN ALASKA,
Wisconsin Univ Madison Geophysical and Polar Research Center
For primary bibliographic entry see Field 8G.
AD-669 224 Not available from CFSTI.

GRAVIMETRY - REPORT ON SCIENTIFIC ACTIVITY IN GEODESY AND GRAVIMETRY IN 1963-1966.
Technical translation.
Aeronautical Chart and Information Center St Louis Mo Linguistic Section
Feb 68, 9p
ACIC-TC-1359
Trans. of mono. Gravimetriya (sic) Moscow, n.d., p61-70, by George Synenko.

Descriptors: (*Geodesics, USSR), Gravity, Meters, Networks, Vacuum apparatus, Quartz, Remote control systems, Automatic, Design, Calibration, Accuracy, Underwater equipment, Scale, Test equipment.
Identifiers: Translations.

The development, manufacture and investigation, both under laboratory and field conditions, have been completed for an automatized vacuum pendulum apparatus necessary for high-precision relative determinations of gravity. The apparatus has thermostatic control; the pressure inside the apparatus is kept close to 1 mm of mercury column. The pendulums are quartz-metal with temperature compensation. The operation of the apparatus is completely automatized and carried out by remote control according to a given program. Periods and amplitudes of pendulum oscillations are recorded by photoelectronic method and are computed from a conversion table. The virtual accuracy of determinations of the gravity increment between two points, performed according to the A-B-A program, is close to plus or minus 0.10 mgal /7, 43, 45/. (Author)
AD-669 228 HC$3.00 MF$0.65

HYPER-SURFACES AND GEODESIC LINES IN 4-D EUCLIDEAN SPACE.
Paper no 17, Geography and the Properties of Surfaces Series,
Harvard Univ Cambridge Mass Lab for Computer Graphics
C. Ernesto, and S. Lindgren. 17 May 68, 17p
Rept no. TR-17
Contract N00014-67-A-0298
See also report no. AD-664 949.

Descriptors: (*Geodesics, Theory), Geometry, Surfaces, Topology, Graphics.
Identifiers: Hypersurfaces, Euclidean space.

The paper introduces general concepts in the generation of hyper-surfaces in 4-D euclidean space, defines curvature and proposes a solution for the determination of the geodesic line through two points. (Author)
AD-669 263 HC$3.00 MF$0.65

GRAVITY METER CALIBRATION RANGES IN AUSTRALIA.
Bureau of Mineral Resources, Geology and Geophysics, Canberra (Australia).
B. C. Barlow. 1967, 49p REPT.-122

Descriptors: *Australia, *Calibrating, *Gravimeters, Geophysics, Standards.

For abstract, see STAR 06 12.
N68-22938 HC$3.00 MF$0.65

8F. Geography

A CATALOGUE OF METEOROLOGICAL DATA OBTAINED DURING THE LINE ISLANDS EXPERIMENT FEBRUARY-APRIL 1967,
National Center for Atmospheric Research Boulder Colo
For primary bibliographic entry see Field 4B.
AD-669 284 HC$3.00 MF$0.65

AREA HANDBOOK FOR COMMUNIST CHINA,
American Univ Washington D C Foreign Area Studies Div
Frederic H. Chaffee, George E. Aurell, Helen A. Barth, John H. Dombrowski, and Neda A. Walpole. Oct 67, 684p
DA-PAM-550-60
Availability: Hardcopy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $5.00. Order as DA-PAM-550-60.

Descriptors: (*Handbooks, *China), Sociology, Geography, History, Population, Language, Education, Religion, Culture, Communism, Government (Foreign), Political science, Economics, Natural resources, Agriculture, Industries, Commerce, Labor, National defense, Armed forces (Foreign).
Identifiers: Area studies.

The volume is one of a series of handbooks designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future. (Author)
AD-669 528 MF$0.65

SHIP WAVES AT RECREATIONAL BEACHES,
California Univ Berkeley Hydraulic Engineering Lab
For primary bibliographic entry see Field 20D.
AD-669 585 HC$3.00 MF$0.65

FEASIBILITY STUDY OF AN INDUSTRIAL PARK ON THE SAN CARLOS APACHE INDIAN RESERVATION, ARIZONA.
Bell (L. H.) and Associates, Phoenix, Ariz.
Nov 67, 230p*
Contract C-320-66

Descriptors: (*Rural areas, Employment), Economics, Industries, Agriculture, Mining engineering, Feasibility studies, Population, Labor, Natural resources, Geology, Copper, Asbestos, Water, Analysis, Chemistry, Arizona.
Identifiers: Tourism, Cutter (Arizona), Apache Indians, San Carlos Apache Indian Reservation, Boycott.

The objectives of this study are many. Included among the most important are: to provide jobs for the San Carlos Apache Indians who are presently underemployed, unemployed, or in need of greater varieties of work or more challenging occupations; to provide a comprehensive document which can be used both to stimulate industrial interest in the study area and to negotiate financing for establishment of the enterprises described and recommended herein; to promote the economic stimulation of the San Carlos Apaches by enabling them to witness for themselves and to participate in the establishment of profit-seeking activities on their own lands.
PB-177 408 HC$3.00 MF$0.65

SELECTED ARCHEOLOGICAL AND HISTORICAL SITES IN WEST VIRGINIA.
Wheeling Coll., W. Va.
For primary bibliographic entry see Field 5C.
PB-177 659 HC$3.00 MF$0.65

TANGANYIKA INDUSTRIAL DEVELOPMENT: A PRELIMINARY STUDY OF BASES FOR THE EXPANSION OF INDUSTRIAL PROCESSING ACTIVITIES.
Little (Arthur D.), Inc., Cambridge, Mass.
For primary bibliographic entry see Field 5C.
PB-177 911 HC$3.00 MF$0.65

8G. Geology and Mineralogy

EXPERIMENTAL DETERMINATION OF THE POSITION OF THE COESITESTISHOVITE PHASE EQUILIBRIUM CURVE (EKSPERIMENTALNOE OPREDELENIE POLOZHENIYA KRIVOI FAZOVOGO RAVNOVESIYA KOUSITSTISHOVIT),
American Meteorological Society Boston Mass
I. A. Ostrovskii. Apr 66, 8p Rept no. T-R-625
Contract AF 19 (628)-3880
Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geologicheskaya, n10 p132-5 1965, by David Kraus.

Descriptors: (*Quartz, *Phase studies), Equilibrium, Pressure, Temperature, Meteorites, Cratering, Impurities, Hermetic seals, Foils, Mathematical prediction, USSR.
Identifiers: Translations.
AD-669 187 HC$3.00 MF$0.65

SEMICONDUCTING DIAMONDS PRODUCED BY ION BOMBARDMENT (POLUPROVODNIKOVYE ALMAZY, POLUCHENNYE METODOM IONNOI BOMBARDIROVKI),
American Meteorological Society Boston Mass
V. S. Vavilov, M. I. Guseva, and E. A. Konorova.
Sep 66, 7p Rept no. T-R-632
Contract AF 19 (628)-3880
Trans. of Fizika Tverdogo Tela (USSR) v8 n6 p1964-5 1966, by George E. Brady, Jr.

Descriptors: (*Diamonds, USSR), (*Semiconductors, Diamonds), Ion bombardment, Lithium alloys, Boron alloys, Ions, Crystals, Electrical conductance, Crystal lattices, Defects (Materials), Impurities, Hall effect, Optical properties, Energy, Valence.
Identifiers: Translations.

The present paper sets forth the results of an experiment in the alloying of natural diamonds with lithium and boron by ion bombardment. The diamonds were alloyed with an ion-beam apparatus with magnetic separation at a focusing angle of 180 degrees. The lithium and boron ions were injected into the natural face of the crystal or into the cleavage plane, either of which was perpendicular to the crystallographic directions (111) and (100). The energy of the ions was 40 kev. (Author)
AD-669 189 HC$3.00 MF$0.65

A GRAVITY SURVEY OF THE CHUKCHI SEA REGION, AND ITS BEARING ON WESTWARD EXTENSION OF STRUCTURES IN NORTHERN ALASKA,
Wisconsin Univ Madison Geophysical and Polar Research Center
Ned A. Ostenso. Feb 68, 18p Rept no. Contrib-192
Contracts Nonr-1202 (16), DA-49-018-eng-3219
Research supported in part by NSF grants GP-1151 and GP-4356.
Availability: Published in Geological Soc. of America Bull., v79 p241-54 Feb 1968.

Descriptors: (*Structural geology, Chukchi Sea), Seismology, Erosion, Isostatic change, Echo ranging, Depth finding, Reefs, Continental shelves, Anomalies, Polar regions, Mountains, Ocean bottom, Deposits, Mapping, Alaska.

Gravity data are used to support the conclusion that the Brooks Range structure is continuous across the Chukchi Sea with the Chukchi-Anadyr fold belt. A morphological reconstruction of this section of the mobile belt that is consistent with known geologic and structural similarities, recorded sub-bottom seismic profiles and observed gravity follows: Moderate Tertiary folding produced a dry-land intercontinental connection that persisted until about a million years ago when erosion finally reduced the low mountain barrier to a near peneplain. Subsequently, the sea shelf has been modified by numerous changes in sea level and deposition of a thin, often patchy veneer of sediments. Scanty gravity data suggest that the Brooks Range structure is not continuous with the Franklin geosyncline to the east. (Author)
AD-669 224 Not available from CFSTI.

GEOPHYSICAL STUDIES IN THE GREENLAND SEA,
Wisconsin Univ Madison Geophysical and Polar Research Center
For primary bibliographic entry see Field 8J.
AD-669 288 Not available from CFSTI.

A COMPILATION OF ARTICLES REPORTING RESEARCH SPONSORED JOINTLY BY THE U. S. ATOMIC ENERGY COMMISSION AND THE OFFICE OF NAVAL RESEARCH.
Washington Univ Seattle Dept of Oceanography
For primary bibliographic entry see Field 8J.
AD-669 290 Not available from CFSTI.

NSF ADVANCED SCIENCE SEMINAR IN ROCK MECHANICS FOR COLLEGE TEACHERS OF STRUCTURAL GEOLOGY 26 JUNE - 28 JULY 1967, BOSTON COLLEGE, CHESTNUT HILL, MASS. VOLUME I,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Robert E. Riecker. 1 Jan 68, 278p
See also Volume 2, AD-669 376.
Availability: Hardcopy available from Dr. Robert E. Riecker, Air Force Cambridge Research Labs., AFCRL-CRJW, Bedford, Mass. 01730. FREE.

Descriptors: (*Rock (Geology), *Mechanics), (*Structural geology, Instructors), (*Instructors, Symposia), Education, Mathematics, Problem solving, Stresses, Analysis, Fracture (Mechanics), Deformation, Strain (Mechanics), Joints, Underground structures, Strain gages, Buckling (Mechanics), Elasticity, Faults (Geology), Folds (Geology), Viscosity, Theory.
Identifiers: *Advanced science seminar, Crust (Earth), *Rock mechanics.

Because of important advances in rock mechanics in recent years, the American Geological Institute proposed that a special course in rock mechanics be held for college teachers of structural geology. Dr. E. G. Bombolakis designed the course at the request of AGI, and Dr. William Chapple provided initial assistance in the planning of course content. The design was reviewed by AGI, lecturers, and the NAS-NRC Rock Mechanics Committee. Financial support was granted through the Advanced Science Seminar Projects of NSF under grant GZ-405. One of the principal objectives proposed to NSF was to have AGI make revised and edited lecture notes available on a nonprofit basis. The production of a raw set of lecture notes under the NSF grant was an initial step in this direction. The limited printing of lecture notes in the present form is another step in this direction. (Author)
AD-669 375 MF$0.65

NSF ADVANCED SCIENCE SEMINAR IN ROCK MECHANICS FOR COLLEGE TEACHERS OF STRUCTURAL GEOLOGY 26 JUNE - 28 JULY 1967, BOSTON COLLEGE, CHESTNUT HILL, MASS. VOLUME II,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Robert E. Riecker. 1 Jan 68, 316p
See also Volume 1, AD-669 375.

Availability: Hardcopy available from Dr. Robert E. Riecker, Air Force Cambridge Research Labs., AFCRLOCRJW, Bedford, Mass. 01730. FREE.

Descriptors: (*Rock (Geology), Mechanics), (*Structural geology, Instructors), (*Instructors, Symposia), Education, Water, Underground, Hydrostatic pressure, Ductility, Strength, Strain (Mechanics), Shear stresses, Twinning (Crystallography), Problem solving, Predictions, Deformation, Sedimentary rock, Faults (Geology), Fracture (Mechanics), Folds (Geology), Theory, Crystal structure, Mathematics, Dislocations.
Identifiers: *Advanced science seminar, Crust (Earth), *Rock mechanics, Strain ellipse theory, Crossbedding, Slip (Geology).

Contents: Experimental evidence for the effects of pore water pressure on the strength and ductility of rocks; Finite homogeneous strain and related topics; Role of experimental rock deformation in dynamic structural geology; Experimental deformation of rocks and the problem of extrapolation to nature; and Flow of rock-forming crystals and aggregates.
AD-669 376 MF$0.65

ALGYO OIL AND GAS FIELD,
Joint Publications Research Service, Washington, D. C.
Akos Ban, Gyorgy Szalanczy, Gerenc Patsch, and Bela Varga. 12 Jan 68, 45p
Trans. of Banyaszati Lapok (Hungary) v100 n10 p697-716 1967.

Descriptors: (*Petroleum industry, Hungary), Petroleum, Structural geology, Geophysics, Drilling, Automation, Rock (Geology), Transportation, Recovery, Stratigraphy, Growth.

Contents: The importance of the Algyo oil field; The geological structure in Algyo; Drilling problems at Algyo; Development trends in the Great Hungarian Plain.
JPRS-43993 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF ULTRA-HIGH VACUUM ADHESION AS RELATED TO THE LUNAR SURFACE QUARTERLY PROGRESS REPORT, 1 JAN. - 30 APR. 1968.
Douglas Aircraft Co., Inc., Santa Monica, Calif. Missile and Space Systems Div.
J. J. Grossman, and J. A. Ryan. 30 Apr 68, 33p
NASA-CR-94425, QPR-14
Contract NAS7-307

Descriptors: *Adhesion tests, *Lunar crust, *Silicates, *Vacuum effects, Adhesion, Anisotropy, Crystallography, Electron microscopes, Lunar topography, Microstructure, Sputtering, Surface properties, Vacuum apparatus.

For abstract, see STAR 06 12.
N68-22843 HC$3.00 MF$0.65

CONTROLLING DRIFTING SAND DUNES ON CAPE COD.
Research rept. no. 7 on Roadside Development, Massachusetts Agricultural Experiment Station, Amherst.
John M. Zak. Mar 67, 16p MAES-Bull-563
Prepared in cooperation with Bureau of Public Roads, Washington, D. C., and the Commonwealth of Mass., Dept. of Public Works.

Descriptors: (*Sand, Erosion), Advanced planning, Roads, Maintenance, Control, Beaches, Drift, Sea breeze, Plants (Botany), Seeds, Test methods, Shrubs, Ecology, Massachusetts.
Identifiers: Cape Cod (Massachusetts).

Various species of grass and a legumes were planted to determine the usefulness of direct seeding (compared to planting American beachgrass) on sand dunes. Coastal panicgrass (Panicum amarulum), switchgrass (Panicum virgatum L.) and Kentucky 31 fescue (Festuca elatior var. arundinacea) gave the best initial results, but they failed to survive as a permanent cover. Several mulch materials (asphalt, hay, fuel oil, etc.) were applied to determine their effectiveness in aiding vegetation establishment. The final results, however, indicated they were of questionable value. Machine planting of culms of beachgrass produced excellent cover by the second year and indicated a spacing of 18 in. x 36 in. as desirable if they were spring planted. It was also found that blow-out areas of sand can produce new dunes by properly locating slat-type fencing. However, in order to maintain stability of the sand, revegetation of the area must be accomplished. Establishing trees and shrubs as a permanent cover for sand dunes is a problem due to lack of moisture, low fertility, sand blasting and high temperatures. Some ecologically adapted plants such as bayberry (Myrica pernnsylvanica), beach plum (Prunus maritina), etc., appear to be most successful when planted in a media of peat, soil and vermiculate.
PB-177 746 HC$3.00 MF$0.65

CARBONATE APATITES,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
I. D. Borneman-Starynkevich, and N. V. Belov. 5 Dec 66, 7p TVA-4213
Trans. of Akademiya Nauk SSSR. Doklady, v90 p89-92 1953, tr. by Carol C. Parr.

Descriptors: (*Minerals, *Crystal structure), (*Phosphates, Crystal structure), Calcium compounds, Fluorides, Carbonates, Crystal lattices, Hydrates, USSR.
Identifiers: *Apatites, Francolites.

A dispute with D. McConnell concerning the isomorphic substitution of calcium by carbon in CO2 apatites is continued.
PB-178 095T HC$3.00 MF$0.65

NEUTRON ACTIVATION TECHNIQUES FOR MINERAL EXPLORATION.
Annual rept.,
Geological Survey, Washington, D. C.
F. Senftle, A. Hoyte, and P. Martinez. 31 Aug 66, 51p
Contract AT (49-11)-2784

Descriptors: (*Geophysical prospecting, *Neutron activation), (*Silver, Geophysical prospecting), Nuclear energy levels, Nuclear reactions, Isotope availability, Decay schemes, Gamma-ray spectra, Half life, Feasibility studies, Sensitivity.

For abstract, see NSA 22 10.
T1D-23668 HC$3.00 MF$0.65

CHANGES IN THE PHYSICAL PROPERTIES OF PEAT-BOG FOREST SOILS DUE TO DRAINAGE (IZMENENIE FIZICHESKIKH SVOISTV TORFYANO-BOLOTNYKH LESNYKH POCHV PRI LESOOSUSHITELNOI MELIORATSII),
National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.
M. A. Belskaya. 1968, 9p SFCSI-Agr (TT-67-51314)
Trans. of Leningradskii Nauchno-Issledovatelskii Institut Lesnogo Khozyaistva. Sbornik Rabot po Lesnomu Khozyaistvu (USSR) v4 p170-9 1961.

Descriptors: (*Soils, Physical properties), (*Drainage, Forestry), Permeability, Density, Moisture, Analysis, Ecology, Classification, Porosity, Water.
Identifiers: Peat bogs.

Drainage melioration introduces considerable alterations in the soil-forming processes, so that the soil acquires different physical and biochemical properties. The nature of such changes has been extensively studied on drained lands reclaimed for agricultural use. In contrast, very little attention has been paid to studies of changes in the soil's physicochemical properties caused by drainage of bogged forest areas, through alterations in the soil's water and air regimes which govern the decomposition of organic matter. However, the alterations in the properties of soils through drainage are not the same on areas reclaimed for agriculture and on those left under the forest; differences are due to ecological conditions and disturbances in the natural development of soil processes introduced by cropping practices on lands reclaimed for agricultural use. In forests, melioration is mainly limited to drainage. (Author)
TT-67-51314 HC$3.00 MF$0.65

8H. Hydrology and Limnology

STUDY OF VARIOUS PROCESSES FOR MARKING SEDIMENTS WITH GOLD-198.
Etude de Divers Procedes de Marquages de Sediments Par l'Or 198
Commissariat A L Energie Atomique, Saclay (France).
S. Jeanneau. Dec 67, 164p CEA-R-3389
Lang- in French

Descriptors: *Gold 198, *Isotopic labeling, *Sediments, Dispersion, Packing density, Statistical analysis, Statistical distributions.

For abstract, see STAR 06 12.
N68-22604 HC$3.00 MF$0.65

1965/66 DEWATERING DELTA MENDOTA CANAL-CENTRAL VALLEY PROJECT, CALIFORNIA.
Progress rept.,
Bureau of Reclamation, Sacramento, Calif.
N. P. Prokopovich. Aug 67, 285p

Descriptors: (*Geology, California), (*Irrigation systems, Cleaning), Water supplies, Ecology, Sedimentation, Algae, Pelecypoda, Spores, Sponges, Water tunnels, Drainage, Graphics, Sampling, California.
Identifiers: Central Valley Project, Limnology.

This report summarizes geologic and biologic data collected mostly during the winter 1965-66 dewatering the Delta-Mendota Canal between milepost 3.5 and milepost 93.24, and supplements data which were recorded during the previous dewaterings of the canal. The character of the 1965-66 data is similar to the data obtained during two previous dewaterings in the winters of 1962-63 and 1964-65. The study consists of geologic and ecologic sampling, including sampling by scuba divers conducted just before the beginning of the dewatering, mapping of sediments and laboratory studies of collected samples. The dewatering was also used for a reconnaissance biogeochemical study of canal sediments.
PB-177 783 HC$3.00 MF$0.65

8J. Physical Oceanography

HALINE CONVECTION INDUCED BY THE FREEZING OF SEA WATER,
Yale Univ New Haven Conn
Theodore D. Foster. 1968, 8p
Availability: Published in Journal of Geophysical Research, v73 n6 p1933-8 Mar 1968.

Descriptors: (*Sea water, Antarctic regions), Mathematical analysis, Freezing, Salinity, Convection (Heat transfer), Ice, Thermal properties, Atmospheric temperature, Surface temperatures, Density, Halides, Polar regions.
Identifiers: Winter (Season).

The onset of haline convection induced by the freezing of sea water is investigated. The linear analysis appropriate to the onset of thermal convection is applied to haline convection by replacing the temperature variables in the equations with salinity variables. Expressions for the time necessary for the onset of manifest convective behavior and the horizontal spacing of the convection cells are derived for various manners of increasing the salinity at the top surfaces. For molecular coeffi-

cients of viscosity and diffusion and cooling conditions that may be appropriate for the freezing season in the Antarctic it is found that the initial horizontal spacing of convection cells is about 0.3 cm. (Author)
AD-669 286 Not available from CFSTI.

GEOPHYSICAL STUDIES IN THE GREENLAND SEA,
Wisconsin Univ Madison Geophysical and Polar Research Center
Ned A. Ostenso. Jan 68, 29p Rept no. Contrib-193
Contracts Nonr-1202 (16), Nonr-2020 (29)
Prepared in cooperation with Arctic Inst. of North America.
Availability: Geological Society of America Bulletin, v79 p107-32 Jan 1968.

Descriptors: (*Marine geology, Greenland Sea), Gravity, Terrestrial magnetism, Faults (Geology), Seismic waves, Continental shelves, Arctic Ocean, Epicenter, Orogeny, Ice islands, Ocean bottom topography, Anomalies.
Identifiers: Mid-Atlantic Ridge, Crust (Earth), ARLIS-2 ice island.

Magnetic, gravity, and seismic sub-bottom profiles are used to contribute to the structural interpretation of the Greenland Sea and environs. The most anomalous feature of the magnetic survey is the subdued magnetic expression of the Mid-Atlantic Ridge north of the Jan Mayen fracture zone. Over the median rift valley magnetic anomalies are an order of magnitude smaller than those recorded in the Atlantic Ocean. A suggested explanation, supported by seismic data, is that crustal tension decreases northward along the ridge. The inferred structural consequence is that the tensional mid-oceanic ridge merges into the compressional Verkhoyansk Range beneath the Arctic Ocean. The sub-bottom profile off the east coast of Greenland reveals three widely separated faults. These correlate with projections of known tectonic features and suggest: (1) The thrust fault of the main Caledonian orogeny of northeastern Greenland extends to a depth in excess of 3 km and continues into the ocean floor at least 85 km from the coast; (2) the Jan Mayen fracture zone, which offsets the Mid-Atlantic Ridge, extends into Greenland at approximately 72 degrees N; and (3) the Caledonian fold belt may correlate directly between eastern Greenland and northern Britain. (Author)
AD-669 288 Not available from CFSTI.

A COMPILATION OF ARTICLES REPORTING RESEARCH SPONSORED JOINTLY BY THE U. S. ATOMIC ENERGY COMMISSION AND THE OFFICE OF NAVAL RESEARCH.
Technical repts.,
Washington Univ Seattle Dept of Oceanography
Darrelyn S. Milne, C. R. B. Lister, M. Grant Gross, D. A. McManus, and Chester F. Royse, Jr. Apr 68, 48p Rept nos. TR- (214-220), Ref-M68-32
Contracts Nonr-477 (37), AT (45-1)-1725
Availability: Published in various journals.

Descriptors: (*Oceanology, Reports), Marine biology, Continental shelves, Sedimentation, Lakes, Reflection, Echo ranging, Radioactive fallout, Washington (State), Rivers, Crustacea, Geophysical prospecting, Deep water, Pacific Ocean, Oregon.

Contents: Sergestes Similis Hansen and S. Consobrinus N. sp. (Decapoda) from the northeastern Pacific; Sonar reflection profiling on the Columbia river and in Lake Washington; Distribution and movement of radioactive continental shelf sediment; Continental shelf sediment, northwestern United States; Mazama ash from the continental slope off Washington; A device for releasing a piston corer and deactivating the piston; Sinking rates of radioactive fallout particles in the north east Pacific Ocean.
AD-669 290 Not available from CFSTI.

THE EASTERN ARTIC ICE SEASONAL OUTLOOK.
Naval Oceanographic Office Washington D C
For primary bibliographic entry see Field 8L.
AD-669 302 MF$0.65

THE CENTRAL SUBMARINE ARCTIC RIDGE AND ITS PLACE IN THE RIDGE SYSTEM OF THE ARCTIC OCEAN (PODVODNYI SREDINNYI ARKTICHESKII KHREBET I EGO MESTO V SISTEME KHREBTOV SEVERNOGO LEDOVITOGO OKEANA),
Naval Oceanographic Office Washington D C
I. I. Rassokho, L. I. Seichura, and P. M. Demenitskaya. 1968, 7p Rept no. NOO-Trans-379
Trans. of Akademiya Nauk SSSR. Doklady, v172 n3 p659-62 1967, by M. Slessers.

Descriptors: (*Ocean bottom topography, Arctic ocean), Ocean bottom, Magnetic fields, Surface properties, Geophysics, Seismology, Mountains, Sedimentary rock, Thickness, Structural geology, Penetration, Fracture (Mechanics), Cracks, Anomalies, Maps, USSR.
Identifiers: Translations.

The Central Submarine Arctic Ridge is considered as a continuation of the Mid-Atlantic Ridge. It represents an epiplatform orogeny which is developing on the present ocean platform, and which differs from the Lomonosov and Mendeleyev ridges by geological, magnetic and seismic features. (Author)
AD-669 422 HC$3.00 MF$0.65

OCEANOGRAPHIC THERMAL GRADIENT DISPLAY STUDY.
Futuronics Corp Port Washington N Y
For primary bibliographic entry see Field 8C.
AD-669 488 HC$3.00 MF$0.65

WATER MASSES OF THE SEA OF OKHOTSK,
Joint Publications Research Service, Washington, D. C.
K. V. Moroshkin. 10 Jan 68, 100p
Trans. of mono. Vodnye Massy Okhotskogo Morya, Moscow, 1966 p1-66.

Descriptors: (*Oceanology, USSR), Ocean currents, Temperature, Salinity, Oxygen, Ecology, Velocity, Biophysics, Oceanographic data, Tides, Boundary layer.
Identifiers: Sea Okhotsk, Kurile Straits.

There are but few studies devoted to the investigation of the water masses of the Sea of Okhotsk, and they have been made on the basis of very limited material (data). The development of this problem was significantly hampered by the quite insufficient number of observations in the central and southern deep-water sectors and in the deep Kurile Straits. The observation materials of the Okhotsk Sea expeditions of The Academy of Sciences USSR Institute of Oceanography on the research vessel Vityaz' from 1949 - 1953 to a considerable extent filled the gaps which had existed in the research, and permitted one to form a more complete concept concerning the water masses in deep-water parts of the sea and in the region of the Kurile Straits and to arrive at a solution of this problem for the entire sea. (Author)
JPRS-43942 HC$3.00 MF$0.65

8K. Seismology

STUDY OF SHORT-PERIOD SEISMIC NOISE.
Final rept.,
Geotech, Garland, Tex.
J. W. Guyton. Aug 63, 22p TR-63-77
Contract AF 49 (638)-1150

Descriptors: (*Seismological stations, Instrumentation), Measurement, Magnetic recording systems, Analog-to-digital converters, Spectrum analyzers, Digital computers, Signal-to-noise ratio, Phased arrays, Seismic waves, Data processing systems.
Identifiers: Seismic noise.

Progress in the study short-period seismic noise. (Author)
AD-416 127 HC$3.00

A GRAVITY SURVEY OF THE CHUKCHI SEA REGION, AND ITS BEARING ON WESTWARD EXTENSION OF STRUCTURES IN NORTHERN ALASKA,
Wisconsin Univ Madison Geophysical and Polar Research Center
For primary bibliographic entry see Field 8G.
AD-669 224 Not available from CFSTI.

ANALYSIS OF GROUND MOTION AND CONTAINMENT,
Environmental Research Corp Alexandria Va
For primary bibliographic entry see Field 18C.
AD-669 483 HC$3.00 MF$0.65

METHODS OF ANALYSIS OF SEISMIC DATA. APPENDIX I; RADAR AND SEISMIC SIGNAL DETECTION. APPENDIX II; THE ISOTROPIC MODEL OF MICROSEISMS. APPENDIX III; SOME NEW RESULTS IN SPECTRAL ESTIMATION.
Semi-annual technical summary rept. no. 2, 1 Jan-30 Jun 64,
Uppsala Univ (Sweden) Seismological Inst
Markus Bath. 20 Jul 64, 65p Rept no. 14
Contract AF 61 (052)-702, ARPA Order-292
Availability: Published in Appendix I prepared for publication by Charles Griffin and Co., Ltd. London (England).

Descriptors: (*Seismological stations, Sweden), Seismic waves, Detection, Radar signals, Noise, Sensors, Phased arrays, Communication systems, Radar antennas, Nuclear explosions, Seismometers, Networks, Microseisms, Earthquakes, Fourier analysis, Computer programs.
Identifiers: Vela-Uniform.

The purpose is to bring together these two fields so as to emphasize their similarities and differences. Because of the narrow-band character of radar signals, it is possible to give a simplified treatment of radar antennas in the first three chapters. Later chapters will treat the more difficult problem of seismic arrays where the signals have bandwidths of up to three octaves. (Author)
AD-669 511 Not available from CFSTI.

INJECTION WELL, EARTHQUAKE RELATIONSHIP ROCKY MOUNTAIN ARSENAL, DENVER, COLORADO.
Army Engineer District Omaha Nebr
For primary bibliographic entry see Field 13B.
AD-669 600 HC$3.00 MF$0.65

PROPAGATION OF LOVE WAVES IN LAYERS WITH IRREGULAR BOUNDARIES.
New York Univ., N. Y. Dept. of Mechanical Engineering.
B. Wolf. Apr 68, 19p NASA-CR-94362, S-68-1
Contract NGR-33-016-067

Descriptors: *Half spaces, *Integral equations, *Love waves, Boundary layers, Contours, Elastic sheets, Perturbation, Roots of equations, Surface waves, Wave propagation.

For abstract, see STAR 06 12.
N68-22350
HC$3.00 MF$0.65

HISTORICAL AND CLIMATOLOGICAL STUDY OF GRINNELL GLACIER, MONTANA.
Technical memo.,
Weather Bureau, Salt Lake City, Utah. Western Region.
Richard A. Dightman. Jul 67, 31p WBTM-WR-24

Descriptors: (*Glaciers, Montana), History, Growth, Temperature, Atmospheric precipitation, Measurement, Analysis, Climatology.
Identifiers: Grinnell Glacier (Montana).

Contents: Introduction, Temperature history, Precipitation history, Recent climatic measurements; and Discussion of climatic data.
PB-178 071 HC$3.00 MF$0.65

8L. Snow, Ice, and Permafrost

DEEP CORE STUDIES OF THE ACCUMULATION AND DENSIFICATION OF SNOW AT BYRD STATION AND LITTLE AMERICA V, ANTARCTIA.
Research rept.,
Cold Regions Research and Engineering Lab Hanover N H
Anthony J. Gow. Mar 68, 51p Rept no. CRREL-RR-197

Descriptors: (*Snow, Antarctic regions), Density, Ice, Drilling, Stratigraphy, Cold weather tests, Thickness, Periodic variations, Atmospheric temperature, Surface temperatures, Volume, Ice islands, Freezing, Polar regions.
Identifiers: Byrd Station, Little America.

Snow and ice cores from two deep drill holes in Antarctica were studied to determine past records of snow accumulation and density variations with depth in the Antarctic ice sheet. Data on the variation of porosity and ice load with depth were also obtained. Byrd Station, located on the inland ice of West Antarctica, was the site of the first drill hole, which reached a depth of 309 m in ice estimated to be about 2500 m thick. Detailed analysis of the core stratigraphy to 88.6 m depth showed that the snow has been accumulating at an average rate of 15.6 g cm sq cm. annually since 1549 AD. (Author)
AD-669 248 HC$3.00 MF$0.65

THE EASTERN ARCTIC ICE SEASONAL OUTLOOK.
Special pub.
Naval Oceanographic Office Washington D C
1968, 8p Rept no. NOO-SP-60 (68)
Availability: Hard copy available from Naval Oceanographic Office, Washington, D. C. 20390, $0.10.

Descriptors: (*Arctic regions, Sea ice), (*Sea ice, Predictions), Naval operations, Climatology, Logistics, Weather forecasting, Shipping (Marine), Maps.

The seasonal ice outlook presents a written and graphic description of ice conditions expected during forthcoming operations of the Military Sea Transportation Service (MSTS) in the eastern Arctic. Prognostic monthly ice charts with envelopes showing the expected range of sea ice from mid-May through mid-August are presented. Forecast trends for ports of major interest in MSTS resupply operations are given. The new World Meteorological Organization (WMO) ice terminology and symbols are used throughout the Outlook. (Author)
AD-669 302 MF$0.65

ALBEDO OF ICE IN THE ARCTIC SEAS ACCORDING TO DATA FROM AIRCRAFT OBSERVATIONS,
Rand Corp Santa Monica Calif
A. Ya. Buzuyev, N. P. Shestirikov, and A. A. Timerev. Apr 68, 12p Rept no. P-3835
Trans. from Problemy Arktiki I Antarktiki (USSR) n20 1965, by S. M. Olenicoff.

Descriptors: (*Ice, Albedo), Arctic Ocean, Thermocouple pyrometers, Radiometers, Gimbals, Potentiometers, Airborne, USSR.
Identifiers: Translations.

During the summer and autumn of 1963, actinometric observations were performed from ice reconnaissance airplanes and the 'Flying Meteorological Observatory' operating in the western sector of the Arctic. The experience gained verified that this was a feasible and inexpensive way of accumulating data on the albedo of ice in the Arctic regions.
AD-669 560 HC$3.00 MF$0.65

MEASUREMENT OF NATURAL PARTICULATE FALLOUT ONTO HIGH POLAR ICE SHEETS. PART II. ANTARCTIC AND GREENLAND CORES.
Cold Regions Research and Engineering Lab Hanover N H
For primary bibliographic entry see Field 14B.
AD-669 612 HC$3.00 MF$0.65

8M. Soil Mechanics

STRUCTURE AND FOUNDATION BEHAVIOR DURING ANTENNA OPERATION, TAA-2A VERO BEACH, FLORIDA, AND TAA-3 MERRITT ISLAND, FLORIDA,
Army Engineer Waterways Experiment Station Vicksburg Miss
Jack Fowler, and Roy E. Leach. Mar 68, 69p Rept no. Miscellaneous Paper-4-983

Descriptors: (*Soils, *Foundations (Structures)), Florida, Loading (Mechanics), Soil mechanics, Towers, Intensity, Attenuation, Motion, Resonant frequency, Monitors, Transducers, Velocity, Acceleration, Deflection, Vibration, Radar antennas.

The report describes a study conducted to determine the motion of the structure and foundation during antenna operation for the: (a) TAA-2A radar tower, Vero Beach, Florida, and (b) TAA-3 antenna, Merritt Island, Florida. Specifically, these tests determined the magnitude and direction of displacement, natural frequencies, phase of movement, and attenuation characteristics of the structure and foundation. These tests were performed using maximum programmed antenna accelerations, velocities, and decelerations, which were recorded for correlations. Motion in three planes--vertical, radial, and tangential--was monitored at different transducer locations by means of velocity-type pickups. Theoretical procedures described in EM 1110-345-310 were used to predict the frequencies and displacements that would occur. (Author)
AD-669 239 HC$3.00 MF$0.65

EVOLUTION OF DRAINAGE PATTERNS.
Final rept.,
Iowa State Univ Ames Soil Research Lab
Keith W. Anderson, R. L. Handy, and R. A. Lohnes. 13 May 68, 47p Rept no. Contrib-68-3
Contract Nonr-4868 (01)

Descriptors: (*Soils, Drainage), Density, Erosion, Deposits, Rivers, Climatology, Measurement, Iowa, New Mexico, Hawaii.

Quantitative study of the evolution of drainage basins focused on measures of drainage dissection which included the drainage density envelope, drainage density, and absolute drainage density. Measurements on streams in Iowa, New Mexico, Hawaii, North Carolina, and Indiana resulted in the following conclusions: The drainage density envelope provides insight into the understanding of the evolution of drainage nets, but is not useful in interpreting external controls such as climate; Drainage density is a property of an allometrically growing system which describes the internal features of the drainage net, but cannot be used as an indicator of relative age, climate or lithologic controls; Absolute drainage density is a measure of the extent to which a portion of land has been dissected by fluvial erosion and can be used as an indicator of relative age, climate and lithology differences. It was also found that cultivation has had no measurable effect upon the erosional geometry of drainage basins using the drainage basin as a geomorphic unit. (Author)
AD-669 482 HC$3.00 MF$0.65

SOIL SURVEY AND SUPPORT ACTIVITIES OPERATION DISTANT PLAIN EVENT 6.
Final rept.,
Army Engineer Waterways Experiment Station Vicksburg Miss
J. L. Gatz. Apr 68, 40p Rept no. Miscellaneous Paper-3-990

Descriptors: (*TNT, Explosion effects), (*Soils, Mechanical properties), Nuclear explosions, Simulation, Piezoelectric gages, Silt, Instrumentation, Clay, Sampling, Gravel, Classification, Soils, Moisture, Shock waves, Blast, Physical properties, Site selection, Test methods.
Identifiers: Distant plain operation, Overpressure.

The soil survey and related activities described in this report were conducted to provide information concerning in situ soil characteristics and groundwater conditions and to provide undisturbed samples for determination of static and dynamic properties of the soil in the zone of influence of Distant Plain Event 6, a 100-ton, high-explosive (HE) test. Additional borings were made to obtain preliminary subsurface information in the area of other HE tests, Distant Plain Event 1A and Prairie Flat. The soil survey was conducted in the glaciolacustrine deposits at the Watching Hills site located on the Defence Research Establishment, Suffield (DRES), reservation. Twelve undisturbed and 15 general sample borings were made to a maximum depth of 101.4 ft. All soil samples were transported to the U. S. Army Engineer Waterways Experiment Station (WES) for testing and analysis. Nine piezometers were installed in the previous substrata, and water level observations were made during the conduct of the field exploration by WES. During the period of observation, the water table remained constant at elevation 2142, 20 to 25 ft below the ground surface. Test results presented herein consist of visual laboratory classification and natural water content of the soils. (Author)
AD-669 616 HC$3.00 MF$0.65

SOIL CONGEALING. 7 - EXPERIMENTS IN THE ONE-DIMENSIONAL CONGEALATION OF DIFFERENT SOIL SAMPLES.
Gelivite des Sols. 7 - Etude Experimentale de La Congelation Unidimensionnelle de Differents Echatillons de Sol
Centre National de La Recherche Scientifique, Meudon (France). Laboratoire D'aerothermique.
B. Le Fur, and J. A. Puente. Dec 67, 27p REPT.-67-9
Lang- in French

Descriptors: *Freezing, *Soils, *Temperature measurement, Gelation, Temperature profiles, Thermodynamic properties.

For abstract, see STAR 06 12.
N68-22011 HC$3.00 MF$0.65

THE PROBLEM OF THE THEORY OF OPERATION OF PLOW SHARES,
National Tillage Machinery Lab., Auburn, Ala.
E. D. Afonin. 1967, 22p
Trans. of Selsko-Khozyaistvennyi Institut, Kuibyshev. Izvestiya (USSR) v18 p245-59 1966.

Descriptors: (*Soil mechanics, Machines), (*Machine tools, USSR), Deformation, Physical properties, Mechanical properties, Stresses, Cutting tools, Compressive properties, Particle size, Strain gages, Design, Sand, Agriculture.
Identifiers: Translations.

The energy of the plowing process is determined mainly by the nature of the course of the deforma-

tion process and the breakup of the soil slice. This in turn depends on the physical-mechanical properties of the soil and type of stress conditions created in it by the operation of the tool of the tillage machine. The breakup of the soil slice during plowing is a complex process and in spite of the fact that wide investigations have been conducted of this problem, the complete picture is still not available. Comprehensive studies of the processes of deformation and breakup of the soil with different working tools are given. (Author)
PB-176 836T HC$3.00 MF$0.65

ESTABLISHMENT AND MANAGEMENT OF ROADSIDE VEGETATIVE COVER IN MASSACHUSETTS.
Research rept. no. 6 (Final), on Roadside Development,
Massachusetts Agricultural Experiment Station, Amherst.
John M. Zik, and Evangel J. Bredakis. 1 Jan 67, 29p MAES-Bull-562
Prepared in cooperation with Bureau of Public Roads, Washington, D. C., and Massachusetts Dept. of Public Works.

Descriptors: (*Soils, Erosion), (*Erosion, Control systems), Advanced planning, Roads, Maintenance, Plants (Botany), Seeds, Fertilizers, Test methods, Massachusetts.

Studies were made on various phases of establishing and managing roadside vegetation in Massachusetts. Seed mixtures, with recommended varieties, rates of seeding and time of seeding were evaluated and compared with standard practice showing definite economic benefits as well as good turf establishment. Mulching materials for erosion control were evaluated. Hay, woodchips and bark fragments gave best results. Fertilization and liming for improved turf were investigated. After five years, plots without lime or fertilizer showed signs of thinning. Maleic hydrazide (MH-30) was more effective when applied in the spring and produced greater inhibition at eight pounds per acre than at the four pound rate. Several ecologically adapted species of plant materials (Fragrant sumac, Tartarian Honeysuckle, Indigo Bush, etc.) were grown on highway roadsides by direct seeding. Sweetfern (Comptonia peregrina) was grown by planting of rhizomes. During the period of this research (1962-1966) there was a deficiency in precipitation which affected the tests. Conclusions indicate that continued research would be beneficial.
PB-177 367 HC$3.00 MF$0.65

COMPREHENSIVE SETTLEMENT STUDY OF THE INTERSTATE FILL ACROSS THE JAMES RIVER.
South Dakota Dept. of Highways. Foundation Section.
For primary bibliographic entry see Field 13B.
PB-177 385 HC$3.00 MF$0.65

CALCULATION OF THE INFLUENCE OF THE RELIEF OF A LOCALITY FOR GRAVIMETRIC OBSERVATIONS IN UNDERGROUND MINE WORKINGS AND DRILL HOLES,
Geological Survey, Denver, Colo.
Yu. N. Vashchilov. Oct 67, 8p
Trans. of Razvedochnaya i Promyslovaya Geofizika (USSR) n51 p71-5 1964, tr. by Patrick J. Barosh.

Descriptors: (*Geophysics, USSR), Gravity, Measurement, Mining engineering, Terrain, Underground structures, Corrections.
PB-178 158T HC$3.00 MF$0.65

EVAPORATION FROM PEAT SOIL IN RELATION TO CLIMATIC FACTORS AND WATER TABLE (ISPARENIE S TORFYANOI POCHVY V ZAVISIMOSTI OT KLIMATICHESKIKH FAKTOROV I UROVNYA GRUNTOVYKH VOD),
National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.
A. I. Ivitskii. 1968, 17p SFCSI-Agr (TT-67-51306)
Trans. of Pochvovedenie (USSR) n2 p267-81 1938.

Descriptors: (*Soils, USSR), Volumetric analysis, Evapotranspiration, Water, Analysis, Evaporation, Degradation, Aging (Materials), Moisture, Water vapor, Swamps.

In connection with the extensive work of melioration and hydraulic engineering in the USSR, determination of the evaporation from soils became important. In our experiments on evaporation from soil we made a special effort that experimental conditions should approximate natural conditions as closely as possible. Moreover the experimental scheme was designed in such a way as to make it possible to generalize certain conclusions. This paper presents the experimental results obtained by us at the All - Union Research Institute of Bog Management in 1932 - 1934. (Author)
TT-67-51306 HC$3.00 MF$0.65

8N. Terrestrial Magnetism

INTERPLANETARY MAGNETIC FIELD IMP-1, MOTION PICTURE OF THE TRANSVERSE COMPONENTS.
California Univ., Berkeley. Space Sciences Lab.
For primary bibliographic entry see Field 3B.
For abstract, see STAR 06 12.
N68-21897 HC$3.00 MF$0.65

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

THERMAL AGING CHARACTERISTICS OF AERO-SPACE WIRE INSULATION.
Memorandum rept.,
Naval Research Lab., Washington, D. C.
E. L. Brancato, and F. J. Campbell. Jun 60, 54p NRL-MR-1053

Descriptors: (*Electric insulation, *Electric wire), Aging (Materials), Thermal stresses, Circuits, Life expectancy, Degradation, Electric cables, High-temperature research, Aircraft, Mechanical properties, Stresses, Mathematical prediction, Nomographs.

Life versus temperature curves of wire and cable insulations are needed to provide aircraft design engineers with information to design electrical circuits utilizing the minimum wire sizes required to maintain maximum reliability and yet reduce weight and bulk to a minimum. To establish the feasibility of obtaining such curves a procedure, employing functional evaluation and principles of statistical analysis, was developed and applied to produce curves of five wires representing the variations in insulation layer constructions specified in MIL-W-5086A. Cycling temperature studies were conducted on three of these wires. Verifying the application of a relative aging factor formula which can be used to convert cyclic aging to the equivalent aging of a single temperature exposure. (Author)
AD-474 406 HC$3.00 MF$0.65

IMAGING AND STORAGE WITH A UNIFORM MOS STRUCTURE,
Massachusetts Inst of Tech Lexington Lincoln Lab
For primary bibliographic entry see Field 20L.
AD-669 211 Not available from CFSTI.

SUPERCONDUCTING BEHAVIOR OF SEMICONDUCTORS.
Final rept.,
Westinghouse Research Labs Pittsburgh Pa
J. K. Hulm, and C. K. Jones. 15 Apr 68, 9p
AROD-5171:5-P
Contract DA-31-124-ARO (D)-327

Descriptors: (*Superconductivity, Mathematical prediction), (*Semiconductors, Superconductivity), Band theory of solids, Carriers (Semiconductors), Cryogenics, Titanium compounds, Monoxides, Transition temperature, Crystal lattice defects.
Identifiers: Semi-metals, Titanium monoxide.

The purpose of this program has been to study the occurrence of superconductivity in systems wherein the density of conduction electrons may be varied over a wide range of values, such as degenerate semiconductors and semi-metals, and to attempt to relate the experimental results obtained in these investigations to available theoretical models based upon a knowledge of the normal state parameters of the materials. (Author)
AD-669 247 HC$3.00 MF$0.65

FREQUENCY ACCURACY OF THE BARIUM OXIDE BEAM TUBE.
Army Electronics Labs Fort Monmouth N J
For primary bibliographic entry see Field 14B.
AD-669 259 HC$3.00 MF$0.65

CONTACTLESS RELAYS USING TUNNEL DIODES AND TRANSISTORS (BESKONTAKTNYE RELE NA TUNNELNYKH DIODAKH I TRANZISTORAKH),
Foreign Technology Div Wright-Patterson AFB Ohio
I. Ya. Bilinskii, and P. P. Treis. 13 Jul 67, 14p
Rept no. FTD-MT-67-13
Edited machine trans. of Akademiya Nauk Latviiskoi SSR, Riga. Institut Elektroniki i Vychislitelnoi Tekhniki. Trudy, v6 p255-63 1964.

Descriptors: (*Switching circuits, Semiconductor devices), Tunnel diodes, Transistors, Electric relays, Resistance (Electrical), Wiring diagrams, USSR.
Identifiers: Translations.

Relay circuits comprising a tunnel diode and a transistor operating as a switch are briefly described. The principal circuit has a rectangular 'input-output' characteristic, and its operation and release thresholds depend only slightly on the ambient temperature and supply voltage; the capacitor C increases the noise immunity but decreases the maximum switching frequency. The second circuit has five different input-output characteristics; the relay is much more sensitive but its thresholds depend on the supply voltage. The switching is determined by the transistor characteristics; a switching frequency of 500 kc was easily obtained in experimental tests. Characteristics of the tunnel diode, transistor, and combined characteristics of the relay are briefly discussed; principal formulas are supplied. (Author)
AD-669 309 HC$3.00 MF$0.65

INTERNAL PHOTOEMISSION IN EVAPORATED Al-Al2O3-Al THIN FILM DEVICES.
Air Force Avionics Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20C.
AD-669 331 HC$3.00 MF$0.65

SEMICONDUCTOR JUNCTION PROPERTIES AS INFLUENCED BY CRYSTALLOGRAPHIC IMPERFECTIONS.
Final rept. 15 Feb 65-15 Feb 68,
International Business Machines Corp Hopewell Junction N Y East Fishkill Facility
Guenter H. Schwuttke. Mar 68, 25p Rept no. IBM-TR-22.613

AFCRL-68-0175
Contract AF 19(628)-5059

Descriptors: (*Semiconductor devices, *Crystal lattice defects), Transistors, Crystal structure, Non-destructive testing, Silicon, Diffusion, X-ray diffraction analysis, Defects (Materials), Microscopy, Dendritic structure, Phosphorus.

A short summary of the major results of semiconductor junction properties as influenced by crystallographic imperfections. Reference is made to the previous technical reports and scientific publications in which detailed discussion of the various phenomena is presented. (Author)
AD-669 335 HC$3.00 MF$0.65

HETEROJUNCTION DEVICES.
Final rept. Dec 64-Dec 67,
Syracuse Univ N Y Dept of Electrical Engineering
Richard L. Anderson, G. Zeidenbergs, and Mark Davis. Mar 68, 85p
RADC-TR-68-70
Contract AF 30(602)-3637

Descriptors: (*Semiconductor devices, Manufacturing methods), (*Semiconductors, Band theory of solids), Epitaxial growth, Tunneling (Electronics), Electrical properties, Optical properties, Field effect transistors, Integrated circuits, Gallium arsenides, Gallium compounds, Phosphides, Silicon, Doping.
Identifiers: *Heterojunction devices, Gallium phosphide.

Sections I and II describe work done during the past year on the GaAs GaP heterojunction system. An open tube epitaxy system with HCl as a carrier gas was used to deposit GaAs upon GaP. From the deposits n-n, n-p and p-n GaAs-GaP heterojunctions were constructed. The electrical and optical properties were studied to determine the energy band profiles and approximate models for the current carrying mechanisms. Section III covers experimental work which was carried out on n-p Si-GaP heterojunctions to demonstrate explicitly the existence of inversion layers and study the feasibility of a field effect device. Section IV summarizes the work done over the whole three year contract span. (Author)
AD-669 365 HC$3.00 MF$0.65

THE CURRENT PRINCIPLE OF TRANSISTOR APPLICATION (TOKOVYI PRINTSIP ISPOLZOVANIYA TRANZISTORA),
Foreign Technology Div Wright-Patterson AFB Ohio
I. Akulinichev. 12 Jul 67, 10p Rept no. FTD-HT-23-946-67
Unedited rough draft trans. of Radio, Moscow (USSR) n10 p54-5 1966, by J. Anderson.

Descriptors: (*Transistors, *Circuits), Pentodes, Television equipment, Design, Current amplifiers, USSR.
Identifiers: Translations.

The author discusses transistors and points out what he considers errors in current circuits employing both pentodes and transistors. He also makes for the suggestions for other circuits suitable for transistors and describes modifications which he made to improve a television circuit.
AD-669 426 HC$3.00 MF$0.65

HARMONIC ANALYZER FOR MEASURING FIRST AND SECOND DERIVATIVES OF I-V CHARACTERISTICS OF TUNNEL DIODES AND POINT-CONTACT DIODES,
Foreign Technology Div Wright-Patterson AFB Ohio
Yuan-hua Hsu. 25 Aug 67, 19p Rept no. FTD-HT-66-507
Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v20 n9 p919-26 1964.

Descriptors: (*Harmonic analyzers, *Diodes (Semiconductor)), Electric currents, Voltage, Harmonic analysis, Measurement, Tunnel diodes, China.
Identifiers: Translations.

An instrument for measuring the first and second derivatives of I-V characteristics of tunnel diodes and point contact diodes as a function of D.C. bias was designed. The principle of operation is based on the harmonic analysis of the current. The circuit involved is rather simple. As an example for the application of this instrument, plots of first and second derivatives of a tunnel diode and a point contact diode were shown. From the given results, it was pointed out that tunnel diodes may be used in low level detectors. (Author)
AD-669 514 HC$3.00 MF$0.65

A CENTER OF COMPETENCE IN SOLID STATE MATERIALS AND DEVICES,
Florida Univ Gainesville Coll of Engineering
For primary bibliographic entry see Field 20L.
AD-669 580 HC$3.00 MF$0.65

AGING OF COLDWELD-SEALED QUARTZ CRYSTAL UNITS.
Technical rept.,
Army Electronics Command Fort Monmouth N J
Joseph M. Stanley. Feb 68, 34p Rept no. ECOM-2946

Descriptors: (*Quartz resonators, Aging (Materials)), Reliability (Electronics), Crystal holders, Seals, Bonding.

Design considerations for making reliable military coldweld holders are reviewed along with information on precautions to be taken for achieving reliable seals. Data is presented to show the improvement in aging of coldwelded general-purpose military crystal units over similar units in glass- and solder-sealed metal holders. Similarly, comparison of the aging of miniature crystal units in coldwelded HC-18/U and TO-5 military type holders shows the substantially improved performance of the units in the TO-5 type. The results of aging tests made on SSB crystal units in various metal coldweld holder configurations are reviewed and compared with similar units in glass holders. The two to one improvement in the aging of the coldwelded units is indicated to be due in part to the coldweld method of sealing but mainly to vacuum baking and coldweld sealing in the same high-vacuum environment. Data is also shown to indicate the effect of the bonding agent and holder configuration on the frequency-time stability of coldweld SSB crystal units. Single sideband crystal units in coldwelded HC-6/U holders are shown to be more stable than those in other metal holder configurations. Their average weekly aging rate indicates that the average frequency change in a 20,000-hour reliability period would be 12 x 10 to the minus 8th power. (Author)
AD-669 592 HC$3.00 MF$0.65

FABRICATION OF DIELECTRIC SWITCH ELEMENTS.
Final rept.,
Stevens Inst of Tech Hoboken N J Davidson Lab
George W. Zepko. Dec 67, 20p Rept no. 1219
Contract DA-18-001-AMC-932 (X)

Descriptors: (*Electric switches, Dielectrics), Manufacturing methods, Inductance, Capacitors, Polyester plastics, Films, Plastic coatings, Polyethylene plastics, Aluminum, Wire, Foils, Tapes, Cellulose acetates.

The report describes the steps to be taken in the fabrication of switch elements for a solid-dielectric low-inductance switch which can be used in high-energy discharge circuits. The elements are used in a type of switch having an inductance of 1 x 10 to the minus 9th power H, current carrying capability of 1000,000, and switch delay time of from 0.1 to 0.0000003 sec. Switches of this kind have been used at 15 kV and higher, with a low-inductance capacitor bank. (Author)
AD-669 622 HC$3.00 MF$0.65

TRANSVERSE WAVE INTERACTIONS BETWEEN ROTATING ELECTRON BEAMS AND WAVE GUIDES.
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
For primary bibliographic entry see Field 20C.
AD-669 625 HC$3.00 MF$0.65

VOLTAGE CONTROLLED ATTENUATOR.
Revised ed.,
Yale Univ New Haven Conn Dept of Engineering and Applied Science
Peter J. Kindlmann. 19 Sep 67, 4p
AFOSR-68-1061
Grant AF-AFOSR-626-67
Revision of report dated, 28 Aug 1967.
Availability: Published in The Review of Scientific Instruments, v39 n1 p81-2 1968.

Descriptors: (*Attenuators, Voltage), Frequency modulation, Control, Broadband, Operation, Direct current, Low frequency, Response, Diagrams, Resistors, Lighting equipment, Illumination, Electrical impedance.
Identifiers: Voltage controlled attenuators.

A voltage controlled 50 ohm attenuator using photoresistors, variable over a range of 1.5 to 10 dB with a 0 to 10 V control voltage, is described. Useful frequency response is dc to 300 MHz, corresponding to a rise time of approximately 1 nsec. The programming speed is limited by the response of an incandescent bulb. The device can handle inputs of up to 50 V, provided an average power dissipation of 400mW is not exceeded. (Author)
AD-669 661 Not available from CFSTI.

THE RELATIVE PHASE STABILITY OF COAXIAL CABLES AT V.H.F.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
D. F. Fance. Oct 66, 13p Rept no. RAE-TR-66323

Descriptors: (*Coaxial cables, Stability), Phase (Electronics), Radio interferometers, Very high frequency, Great Britain.

The relative phase-stability of coaxial cables is of paramount importance in radio-interferometer installations. Experimental results on several different types of coaxial cable under different environmental conditions are given. Recommendations are made for the installation of such cables when carrying interferometer signals at V.H.F. (Author)
AD-669 673 HC$3.00 MF$0.65

A SIMPLIFIED APPROACH TO THE DESIGN OF LOW- PASS ACTIVE FILTERS.
Royal Aircraft Establishment, Farnborough (England).
T. D. Reed. Mar 67, 44p RAE-TR-67224

Descriptors: *Circuits, *Damping, *Frequencies, *Low pass filters, Amplifiers, Formulations, Laplace transformation, Linear filters, Transfer functions.

For abstract, see STAR 06 12.
N68-21909 HC$3.00 MF$0.65

A METHOD OF IDENTIFYING THE ADMITTANCE MATRIX OF JUNCTION TRANSISTORS.
Royal Aircraft Establishment, Farnborough (England).
G. Zoldan. Nov 67, 36p RAE-LIB-TRANS-1262
Tran- Transl. Into English From Alta Frequenza (Milan), V. 35, No. 10, 1966 P 819-829

Descriptors: *Approximation, *Electrical impedance, *Junction transistors, *Performance prediction, Electronic equipment, Matrices (circuits), Numerical analysis, Reliability engineering.

For abstract, see STAR 06 12.
N68-22016 HC$3.00 MF$0.65

IMPROVED STERILIZABLE MULTIPLIER PHOTOTUBES QUARTERLY PROGRESS REPORT, PERIOD ENDING 29 FEB. 1968.
Electro-mechanical Research, Inc., Princeton, N. J. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
18 Mar 68, 11p NASA-CR-94244, QPR-5
Contracts NAS7-100, JPL-951555
Prep- Prepared for Jpl

Descriptors: *Photomultiplier tubes, *Scintillation counters, *Sterilization, Electrical resistivity, Photocathodes, Photoconductivity, Substrates.

For abstract, see STAR 06 12.
N68-22064 HC$3.00 MF$0.65

PHOTON-COUPLED ISOLATION SWITCH QUARTERLY REPORT, 1 OCT. - 31 DEC. 1967.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
E. L. Bonin, and E. E. Harp. 31 Dec 67, 18p
NASA-CR-94321, REPT.-03-68-25
Contracts NAS7-100, JPL-951340
Prep- Prepared for Jpl

Descriptors: *Integrated circuits, *Photodiodes, *Switching circuits, Gallium arsenides, Isolation, Optical coupling, Phototransistors, Silicon junctions.

For abstract, see STAR 06 12.
N68-22234 HC$3.00 MF$0.65

FEASIBILITY STUDY FOR RELIABLE MAGNETIC CONNECTION SWITCH, PHASE 2 FINAL REPORT.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Stanford Research Inst., Menlo Park, Calif.
For primary bibliographic entry see Field 9B.
For abstract, see STAR 06 12.
N68-22342 HC$3.00 MF$0.65

THE DESIGN OF A SOLID STATE SINGLE ENDED SWITCHING DC TO DC CONVERTER.
Auburn Univ., Ala. Microwave Research Lab.
W. W. Agerton, and M. A. Honnell. 1967, 69p
NASA-CR-61737
Contract NAS8-11184

Descriptors: *Electric generators, *Spacecraft, *Structural design, *Television transmission, *Transformers, Direct current, Performance tests, Prototypes, Systems engineering.

For abstract, see STAR 06 12.
N68-22732 HC$3.00 MF$0.65

FAST LIBERATION OF ENERGY STORED USING SUPERCONDUCTORS.
Liberation Rapide D'energie Stockee Au Moyen de Supraconducteurs
Commissariat A L Energie Atomique, Saclay (France).
G. Prost, and J. Sole. Nov 67, 45p CEA-R-3255
Lang- in French, English Summary

Descriptors: *Electric discharges, *Energy storage, *Superconductors, Circuits, Electric switches.

For abstract, see STAR 06 12.
N68-22983 HC$3.00 MF$0.65

INVESTIGATION OF THE VOLT-SECOND CHARACTERISTICS OF INSULATOR CHAINS (ISSLEDOVANIE VOLT-SEKUNDNYKH KHARAKTERISTIK GIRLYAND ISOLYATOROV),
Bonneville Power Administration, Portland, Oreg.
N. M. Solomonov, and M. P. Tabardanovo. Feb 68, 18p BPA-Trans-9133
Trans. of Nauchno-Issledovatelskii Institut Postoyannogo Toka. Izvestiya (USSR) n10 p38-59 1963.

Descriptors: (*Transmission lines, *Electric insulation), Voltage, Ground (Electrical), Electric discharges, Pulse generators, Pulse analyzers, Oscillographs, Test methods, Graphics, USSR.
Identifiers: Translations.

To discover the influence of a number of little-investigated factors (superposition of the operating voltage, grounding of the conductor in the room and on the support, etc.) on the pulse responses of insulator chains investigations have been carried out at the TVN NIIPT (High Voltage Equipment Laboratory of the Scientific Research Direct Current Institute) on a full-scale model mounting of a 330 kv electric power line. The model of the mounting was hung on insulators so that it would be possible to study the flashover characteristics of the chains on feeding pulses to the mounting with a grounded conductor.
PB-178 155T HC$3.00 MF$0.65

MODEL WITH 1,000 CPS FREQUENCY FOR INVESTIGATING SWITCHING OVERVOLTAGES IN AC ELECTRIC POWER TRANSMISSION (MODELNA CHASTOTE 1000 GTS DLYA ISSLEDOVANIYA KOMMUTATSIONNYKH PERENAPRYAZHENII V ELEKTROPEREDACHE PEREMENNOGO TOKA),
Bonneville Power Administration, Portland, Oreg.
A. V. Korsuntsev, K. I. Pokrovskaya, A. I. Skoibedo, and M. I. Chernobrodov. Jan 68, 16p BPA-Trans-8624
Trans. of Nauchno-Issledovatelskii Institut Postoyannogo Toka. Izvestiya (USSR) n10 p55-69 1963.

Descriptors: (*Switching circuits, *Transmission lines), Models (Simulations), Thyratrons, Motor generators, Pulse generators, Electric discharges, Oscillographs, Phase modulation, USSR.
Identifiers: Translations.

The existing experience in building AC transmission models for investigation of transient processes indicates that such models, when the usual 50 cps frequency is used, are extremely bulky and expensive structures. This becomes apparent in particular in attempts to build a superhigh voltage transmission model, which is distinguished by the great length of transmission lines, low values of active resistance per unit of length, and proportionally high values of the time constant, $T = L/R$. The last value is the factor, determining the consumption of copper for the induction coils of the transmission line model.
PB-178 157T HC$3.00 MF$0.65

THUNDERSTORM RESISTANCE CHARACTERISTICS OF 35 TO 500 KV ELECTRIC POWER TRANSMISSION LINES (KHARAKTERISTIKI GROZOUPORNOSTI VOZDUSHNYKH LINII ELEKTROPEREDACHI 35-500KV),
Bonneville Power Administration, Portland, Oreg.
A. V. Korsuntsev, and L. E. Kuznetsova. Feb 68, 23p BPA-Trans-8695
Trans. of Nauchno-Issledovatelskii Institut Postoyannogo Toka. Izvestiya (USSR) n10 p18-37 1963.

Descriptors: (*Transmission lines, Thunderstorms), Resistance (Electrical), Statistical analysis, Reliability (Electronics), Lightning, USSR, Malfunctions, Failure (Electronics), Design, Power supplies.

The principal parameter of thunderstorm resistance of an overhead power line is the specific number of disconnections caused by thunderstorms per year of operation. From the engineering point of view it is of interest to compare the thunderstorm resistance of power lines of different designs, because it enables us to select the optimum structural parameters for prescribed specific conditions. This optimum solution may vary in different instances. (Author)
PB-178 164T HC$3.00 MF$0.65

REDUCTION OF OVERVOLTAGES IN TUNED ELECTRIC TRANSMISSION LINES IN CASE OF SINGLE-PHASE SHORT CIRCUITS (OGRANICHENIE PERENAPRYAZHENII V NASTROENNYKH ELEKTROPEREDACHAKH PRI ODNOFAZNYKH ZAMYKANIYAKH),
National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.
O. V. Olshevskii, and G. I. Samorodov. 1968, 8p SFCSI-Int (TT-68-50382)
Trans. of Akademiya Nauk SSSR. Sibirskoe Otdelenie. Izvestiya. n6 Seriya Tekhnicheskikh Nauk, n2 p9-15 1964.

Descriptors: (*Transmission lines, USSR), Resistance (Electrical), Voltage, Electrical impedance, Resonance, Transformers, Capacitors, Power supplies.
Identifiers: Short circuits, Tuned transmission lines.

A transmission line with half-wave characteristics, or characteristics similar to half-wave characteristics, may be regarded as a circuit more or less exactly tuned to the frequency of the supply voltage. The resonance properties of a line with such parameters lead to the setting up of considerable overvoltages, when short circuits arise /1, 2/. However, this is valid only for symmetrical disturbances, during which the conditions under which damage occurs are determined by the positive-sequence parameters. Asymmetric disturbances of the normal operation of the line have extremely varying characteristics that depend first and foremost on the type of disturbance, the operating conditions prior to the disturbance, and the parameters of the different sequences, particularly zero sequence. (Author)
TT-68-50382 HC$3.00 MF$0.65

9B. Computers

INTRODUCTION TO THE SIMSCRIPT II PROGRAMMING LANGUAGE,
RAND Corp., Santa Monica, Calif.
Philip J. Kiviat. Feb 66, 7p P-3314

Descriptors: (*Programming languages, Design), Programming (Computers), Computers, Simulation, Coding, Compilers.
Identifiers: Simscript 2, Fortran, Algol.

This report traces the author's thoughts on the design, implementation and structure of simscript II. The report is not exhaustive; it does reflect the major considerations of the language design. (Author)
AD-478 496 HC$3.00 MF$0.65

A MODEL FOR AUTOMATION OF PERSONNEL ASSIGNMENT.
Naval Postgraduate School, Monterey, Calif.
For primary bibliographic entry see Field 5I.
AD-489 885 HC$3.00 MF$0.65

CONIC DISPLAY GENERATOR USING MULTIPLYING DIGITAL-ANALOG DECODERS.
Meeting speech.
Massachusetts Inst of Tech Lexington Lincoln Lab
Howard Blatt. 14 Nov 67, 9p Rept no. MS-1920
ESD-TR-68-63
Contract AF 19 (628)-5167
Availability: Published in Fall Joint Computer Conference, p177-84 1967.

Descriptors: (*Display systems, Curved profiles), (*Analog-digital computers, Display systems), Decoding, Input-output devices.

A computer-driven display generator is in operation, having the capability of drawing parabolas, ellipses, circles, hyperbolas, as well as points and lines. A wideband two-quadrant multiplying decoder was designed as the basic component for this hybrid display generator. Conic sections are generated by forming the ratio of two parametric second degree polynomials. The drawing rate is high enough to enable the generator to simultaneously service several CRT's; resolution is one part in one thousand. (Author)
AD-669 207 Not available from CFSTI.

THE LINCOLN WAND.
Meeting speech,
Massachusetts Inst of Tech Lexington Lincoln Lab
Lawrence G. Roberts. 8 Nov 66, 7p Rept no. MS-1695
ESD-TR-68-62
Contract AF 19 (628)-5167, ARPA Order-691
Availability: Published in Proceedings-Fall Joint Computer Conference, p223-7 1966.

Descriptors: (*Input-output devices, Graphics), (*Graphics, Data processing systems), Time sharing, Position finding, Sensors, Ultrasonic radiation, Performance (Engineering).
Identifiers: TX-2 computer, Lincoln wand, Light pens, Computer aided graphics, Time delay.

A 3-D position sensing device has been designed and installed on the TX-2 Computer at Lincoln Laboratory. It incorporates four ultrasonic transmitters mounted on a display scope and a pen-sized ultrasonic receiver. By measuring the time delay from each transmitter to the receiver, the computer can easily compute the x, y, z position of the WAND. Since four distances are measured, single errors can be corrected. The WAND currently measures its 3-D position 25 times per second and operates over a 4 x 4 x 6 foot volume. It has a resolution of about .02 inches and, therefore, provides about 12 bits per coordinate. The WAND should prove extremely valuable for controlling or drawing 3-D displays. Alternatively, the depth dimension can be used to control value or size while pointing at an item in a 2-D display. (Author)
AD-669 209 Not available from CFSTI.

IMAGING AND STORAGE WITH A UNIFORM MOS STRUCTURE,
Massachusetts Inst of Tech Lexington Lincoln Lab
For primary bibliographic entry see Field 20L.
AD-669 211 Not available from CFSTI.

PROSPECTS OF DIGITAL CIRCUITS WORKING ON THE PRINCIPLE OF CURRENT DISTRIBUTION (PRT) WITH AN INCREASE OF THEIR HIGH SPEED OPERATION AND TEMPERATURE STABILITY (PERSPEKTIVY TSIFROVYKH SKHEM NA PRINTSIPE RASPREDELENIYA TOKA PRI POVYSHENII IKH BYSTRODEISTVIYA I TEMPERATURNOI USTOICHIVOSTI),
Foreign Technology Div Wright-Patterson AFB Ohio
V. G. Kolosov, B. A. Milovidov, and N. I. Radomyslskaya. 11 Aug 67, 18p Rept no. FTD-MT-24-123-67
Edited machine trans. of Politekhnicheskii Institut, Leningrad. Trudy (USSR) n256 p94-101 1965.

Descriptors: (*Logic circuits, Digital systems), Ferrites, Magnetic cores, Magnetic properties, Electrical properties, Switching circuits, Reliability (Electronics), USSR.
Identifiers: Translations.

The authors analyze theoretically the various types of circuits based on the principle of current distribution (PCD) and establish the basic pertinent relationships. Methods for circuit calculations (temperature dependence, maximum speed, minimum pulse duration, maximum frequency) of transistorized and ferrite-core containing units are developed and applied to a specific example of a standard fast, reliable unit and a PCD transmitting cell in four-cycle operation. This four-cycle cell operates with useful loads which are only one quarter of the load found under two-cycle operating conditions. This leads to a decrease in the number of triodes used, and the intensity of currents. The resulting digital elements are thus more reliable.
AD-669 268 HC$3.00 MF$0.65

ON THE QUESTION OF DIGITAL PERCEPTRON SYNTHESIS (K VOPROSU SINTEZA DISKRETNOGO PERSEPTRONA),
Foreign Technology Div Wright-Patterson AFB Ohio
K. N. Denisov, and E. N. Perevezentsev. 4 Aug 67, 18p Rept no. FTD-MT-24-203-67
Edited machine trans. of Tsentralnyi Nauchno-Issledovatelskii Institut Morskogo Flota. Trudy (USSR) n77 p82-8 1965.

Descriptors: (*Programming (Computers), Computer logic), (*Computer logic, Synthesis), Digital differential analyzers, Simplex method, Linear programming, Pattern recognition, Decision theory, Information theory, Probability, USSR, Algorithms.
Identifiers: Translations, Perceptrons.

The article presents a solution to the problem of synthesizing the logical net of a digital perceptron based on optimum coding and linear programming methods. The structural circuit utilizes simultaneously both recurrent and nonrecurrent forced learning procedures. The recurrent procedure for learning to recognize objects (presented by binary numbers) is based on the simplex method of linear programming. The nonrecurrent procedure is based on the Browning-Bledsoe method of binary digital recognition. Information signs of recognized forms are extracted by computer procedures in general coding (in the sense of the Browning-Bledsoe method), leading to an investigation of the fine structure of the binary numbers by methods in the theory of optimum coding. The algorithms of optimum coding of binary numbers are based on a comparison of divergence and entropy of a series of possible states of the recognition device. Optimum selections of the weighted coefficients in the logical net are determined on the basis of algorithms of the simplex method using digital computers. The authors conclude that the further development of the theory of discrete (digital) perceptron depends on perfecting the recurrent and nonrecurrent learning procedures in pattern recognition devices which involves the use of more general computational methods of mathematical programming. (Author)
AD-669 270 HC$3.00 MF$0.65

USE OF SOEMTRON CALCULATOR-PUNCHED CARD MACHINES FOR THE MECHANIZATION OF CONTROL OPERATIONS (ISPOLZOVANIE SCHETNO-PERFORATSIONNYKH MASHIN 'ZOEMTRON DLYA MEKHANIZATSII UPRAVLENCHESKOGO TRUDA),
Foreign Technology Div Wright-Patterson AFB Ohio
M. Korpus. 6 Jul 67, 14p Rept no. FTD-HT-23-916-67
Unedited rough draft trans. of mono. Sredstva i Metody Mekhanizatsii Podgotovki i Poiska Nauchno-Tekhnicheskoi Informatsii, Inzhenernogo i Upravlencheskogo, Moscow, 1965 p207-13 1965, by F. Dion.

Descriptors: (*Data processing systems, Punched cards), (*Punched cards, Automation), Production control, Input-output devices, Automata, Control systems, Performance (Engineering), USSR.
Identifiers: Translations.

The article discusses the punched card machines produced by the People's Typewriter Plant in Semmerda, which are used in control work: Soemtron 413 magnetic punch, Soemtron 423 magnetic verifier, Soemtron 432 punched card sorter, Soemtron 440 summary punch, Soemtron 402 tabulator, and the ASM 18 computer. Sorter S-432 can sort 42,000 punched-cards an hour in any desired numerical order by means of a brush block. Tabulator 402 (gold medal winner at the 1964 spring fair in Leipzig) processes data on 80-column punched-cards and is used in planning, statistics, computation, and scientific research; it can handle 9000 punched-cards an hour. The summary punch can handle 6000 punched-cards an hour. The ASM 18 computer can be connected to the Tabulator 402. The article describes the automatic operation of an aggregate of these machines, in which the tabulator plays the key role in the final processing of the results of the arithmetic and logical operations of the other machines.
AD-669 277 HC$3.00 MF$0.65

MEMORY DEVICE WITH EXTERNAL SELECTION (ZAPOMINAYUSHCHEE USTROISTVO S VNESHNIM VYBOROM),
Foreign Technology Div Wright-Patterson AFB Ohio
V. N. Sorokin, and N. P. Vashkevich. 13 Sep 67, 11p Rept no. FTD-MT-24-130-67
Edited machine trans. of Moskovskoe Vysshee Tekhnicheskoe Uchilishche. Vychistitelnaya Tekhnika (USSR) n5 p51-7 1966.

Descriptors: (*Magnetic core storage, Design), Ferrites, Electrical properties, Performance (Engineering), Digital computers, USSR.
Identifiers: Translations.

A highly reliable transistorized two-cores-per-bit file memory designed to operate in data processing control systems is described. It consists of: a ferrite-core stack serving as the accumulator store; two address registers; a sampling circuit; a circuit for generating sampling-current pulses; write drivers serving to shape powerful current pulses during data recording; an output signal amplifier; input and output registers; an overwriting circuit; and the operating-cycle control circuit. There are two cores per bit: a memory core and a switch core. The maximum switch time of any core does not exceed 4 msec. The memory device is powered from a 24 v source. The power requirement of the entire device is about 100 w.
AD-669 300 HC$3.00 MF$0.65

CERTAIN TIMING CHARACTERISTICS OF A MULTIPANEL CALCULATING SYSTEM (NEKOTORYE VREMENNYE KHARAKTERISTIKI MNOGOPULTOVOI VYCHISLITELNOI SYSTEMY),
Foreign Technology Div Wright-Patterson AFB Ohio
M. V. Mishurnaya. 1 Sep 67, 13p Rept no. FTD-MT-24-232-67
Edited machine trans. of Vychislitelnaya Tekhnika v Mashinostroenii (USSR) p14-20 1965.

Descriptors: (*Digital computers, Remote control systems), Time sharing, Multiple operation, Coding, Input-output devices, Telegraph systems, USSR.
Identifiers: Translations, Digital data transmission, Minsk-2 computer (USSR).

The present paper is a sequel to one entitled 'The Multi-terminal Computer' by the same author. Each terminal is an input/output teletypewriter linked to a buffer section in the main unit. An interrupt subroutine in the computer is initiated from the input buffer when new data are fed from one of the terminals or when the results of calculations are to be transmitted back to a particular terminal. This subroutine contains provisions for a delay and certain priority decisions to allow for an orderly processing of information by the computer: The time required for a processing of a problem originating from a terminal is calculated. The delay time for the simultaneous operation of several terminals is analyzed and the appropriate formulas are given. All derived expressions are valid for any multi-terminal computer system. The operation of an installation in which the I/O terminals are arranged in groups is discussed and its advantages are pointed out. In this system several terminals

time-share a single communication line and a single section in the input buffer.
AD-669 308 HC$3.00 MF$0.65

ON THE FORWARD END OF SCIENCE SUPPLEMENTATION OF THE BESM DYNASTY (POPOLNENIE DINASTII BESM),
Foreign Technology Div Wright-Patterson AFB Ohio
A. Dorodnitsyn. 31 Oct 67, 6p Rept no. FTD-HT-23-841-67
Unedited rough draft trans. from Izvestiya (USSR) n29 p3 1967, by L. Marokus.

Descriptors: (*Computer storage devices, USSR), Programming (Computers), Problem solving, Frequency, Data storage systems, Velocity.
Identifiers: Translations, BESM 6 computer (USSR).

The document describes the operation the new BESM-6 computer, which has been installed at the computing center of the USSR Academy of Sciences. The computer operates at a speed of one million operations per second and is fully transistorized. Its effectiveness is not determined by the speed of a single device, but by the concordance of work of all its blocks. (Author)
AD-669 314 HC$3.00 MF$0.65

SOVIET CYBERNETICS TECHNOLOGY: XI. HOMOGENEOUS, GENERAL-PURPOSE, HIGH-PRODUCTIVITY COMPUTER SYSTEMS--A REVIEW,
Rand Corp Santa Monica Calif
Harut Barsamian. Apr 68, 33p Rept no. RM-5551-PR
Contract F44620-67-C-0045
Trans. of review of mono. Odnorodne universalne vychislitelne sistemy vysokoi proizvoditelnosti, Novosibirsk, 1966.

Descriptors: (*Computers, USSR), (*Cybernetics, USSR), Multiple operation, Feasibility studies, Data storage systems, Programming (Computers), Automation, Reliability, Problem solving, Reviews.
Identifiers: Minsk-222 computer (USSR), Translations.

This is a review and evaluation of the first Soviet book entirely devoted to problems of high-productivity computing systems. Published in late 1966, the book reports on studies conducted at the Institute of Mathematics in Novosibirsk. Since the Soviet system of national economic planning requires a volume of coordinated, relatively simple calculations, and Soviet computer technology does not equal that of the West, the authors, E. V. Evreinov and Yu G. Kosarev, have sought a way to increase computer productivity without greatly increasing technological demands. Their solution is parallelism: the coupling of 1000 computers, each capable of a million operations per second, so that all work together on the same program at the same time. However, the authors have not succeeded in establishing a new approach based on parallelism that will solve the problems of increased productivity, nor have they made a convincing case for their basic assumptions.
AD-669 321 HC$3.00 MF$0.65

USER'S INSTRUCTIONS FOR 0-1 INTEGER LINEAR PROGRAMMING CODE RIP30C,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 12B.
AD-669 322 HC$3.00 MF$0.65

COLINGO C-10 USERS' MANUAL. VOLUME I.
Mitre Corp Bedford Mass
May 68, 237p Rept no. MTR-35-Vol-1
ESD-TR-66-653-Vol-1
Contract AF 19 (628)-5165
See also Volume 2, AD-669 326.

Descriptors: (*Programming (Computers), Instruction manuals), Programming languages, Data processing systems, Flow charting, Subroutines.
Identifiers: Profile programming language, Colingo C-10 programming system, Data management systems.

The COLINGO C-10 Users' Manual, a combination of tutorial and reference material, is presented in two volumes. This volume contains a general introduction to the system, a description of the C-10 file structure, a reference manual of the PROFILE language, a comparison of the PROFILE language and the COLINGO-D control language, and a section about the C-10 Editor. (Author)
AD-669 325 HC$3.00 MF$0.65

COLINGO C-10 USERS' MANUAL. VOLUME II.
Mitre Corp Bedford Mass
May 68, 166p Rept no. MIR-35-Vol-2
Contract AF 19 (628)-9165
See also Volume 1, AD-669 325.

Descriptors: (*Programming (Computers), Instruction manuals), Programming languages, Data processing systems, Compilers, Flow charting, Subroutines.
Identifiers: Step programming language, Colingo C-10 programming system, Data management systems.

The COLINGO C-10 Users' Manual, a combination of tutorial and reference material, is presented in two volumes. This volume contains information on machine configurations, procedures for operating and loading the system, a description of the C-10 general purpose macro facility (terses and actors), a guide to the STEP language, a set of instructions for preparing machine procedures, and a list of system error messages. (Author)
AD-669 326 HC$3.00 MF$0.65

A GENERAL COMPUTER PROGRAM FOR EVALUATION OF TEMPERATURE PROFILES AND INTERFACE POSITION IN FILAMENTS UNDERGOING SOLIDIFICATION.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11E.
AD-669 329 HC$3.00 MF$0.65

HAND-PRINTED INPUT FOR ON-LINE SYSTEMS.
Technical memo.,
System Development Corp Santa Monica Calif
M. I. Bernstein. 14 Apr 68, 24p Rept no. TM-3937/000/00
Contracts F19628-67-C-0004, NAS12-526

Descriptors: (*Data processing systems, Character recognition), (*Programming (Computers), Character recognition), Input-output devices, Man-machine systems, Time sharing, Real time, Digital computers, Cathode ray tube screens, Flow charting.
Identifiers: On-line systems, Q-32 computer, Rand tablet.

The document describes a program for recognizing hand-printed information in real time, which provides on-line computer users with a means of inputting two-dimensional information as simply as writing with pen and paper. The program operates under the Time-Sharing System on the Q-32 computer at SDC, and uses a RAND Tablet for input and a CRT display (rear-projected on the tablet for output). Each user of the program builds a unique character dictionary, based on samples of his own input characters. For each user, the program currently recognizes about 100 different characters, which are chosen from a larger alphabet by the individual user. The document describes how the recognition program interfaces with the Time-Sharing System; what functions the program performs in recognizing hand-drawn input; and how the character dictionary is constructed and tested. The report concludes by suggesting that the character recognizer will realize its greatest potential by being applied to problems that require free-form (rather than linear keyboard) input. (Author)
AD-669 368 HC$3.00 MF$0.65

A GEOMETRICAL THEORY OF DIFFRACTION ANALYSIS OF THE RADAR CROSS SECTION OF A SECTIONALLY CONTINUOUS SECOND-DEGREE SURFACE OF REVOLUTION.
Ohio State Univ Columbus Electroscience Lab
For primary bibliographic entry see Field 17I.
AD-669 372 HC$3.00 MF$0.65

A TECHNIQUE FOR CONVERTING A KEY PUNCH INTO A COMPUTER PUNCHED CARD READER,
Armed Forces Radiobiology Research Inst Bethesda Md
L. J. Brocato, J. J. Gitelman, and R. W. Rockwell.
Dec 67, 29p Rept no. AFRRI-TN67-4

Descriptors: (*Punched cards, Digital computers), Input-output devices, Synchronization (Electronics), Computer programs, Interfaces, Costs.
Identifiers: Key punch machine.

The report describes a technique for converting a key punch into a punched card reader for use with a small-scale special purpose computer system. The discussion includes a system description, hardware modifications, software analysis and a descriptive software listing. (Author)
AD-669 379 HC$3.00 MF$0.65

IRIG STANDARDS FOR RANGE METEOROLOGICAL DATA REDUCTION. PART I. RAWINSONDE.
Inter-Range Instrumentation Group White Sands Missile Range N Mex Meteorological Working Group
For primary bibliographic entry see Field 4B.
AD-669 393 HC$3.00 MF$0.65

AN IMMEDIATE-ACCESS BUFFER (MEMORY UNIT) FOR AN ELECTRONIC COMPUTER (BUFERNOE OPERATIVNOE ZAPOMINAYUSHCHEE USTROISTVO DLYA ELEKTRONNOI VYCHISLITELNOI MASHINY),
Foreign Technology Div Wright-Patterson AFB Ohio
V. A. Fedorov. 7 Jul 67, 20p Rept no. FTD-MT-24-128-67
Edited machine trans. of Mirovoi Meteorologicheskii Tsentr, Leningrad. Trudy (USSR) n10 p103-11 1965.

Descriptors: (*Data processing systems, *Computer storage devices), (*Weather forecasting, Data processing systems), Data transmission systems, Control, Magnetic recording systems, Magnetic tape, Punched cards, USSR.
Identifiers: Translations.

A buffer operational storage device (BOZU) based on magnetic operational storage devices and buffer coordinating units is used to operate the computer complex for weather forecasting at the SSSR World Meteorological Center. The BOZU provides simultaneous storage of information from different devices with the proper ordering and preprocessing of this information. It also controls the operation of all devices connected with the computer. In one array of the complex the unit automatically receives data from communications channels and records it on one of several buffer tapes to abbreviate the computer input process. The system can also predigest punched cards to expedite their input. The BOZU also accepts the computer output and expedites the dispatch of this information to such associated equipment as automatic chart plotters and weather forecast transmission channels. The computer time utilization is so efficiently coordinated that in one of the most complex operational modes the receiving and

transmitting of information from the computer requires only 30% of the computer time, leaving the remaining 70% for computer analysis.
AD-669 419 HC$3.00 MF$0.65

SELECTION OF AVERAGED STANDARD PICTURES,
Foreign Technology Div Wright-Patterson AFB Ohio
G. L. Gimelfarb. 1 Aug 67, 27p Rept no. FTD-HT-23-908-67
Unedited rough draft trans. of mono. Chitayushchie Avtomaty i Raspoznavanie Obrazov, Kiev, 1965 p138-55, by J. Anderson.

Descriptors: (*Reading machines, *Correlators), (*Pattern recognition, Reading machines), Character recognition, Correlation techniques, Errors, Probability, Algorithms, Masking, Relaxation oscillators, USSR.
Identifiers: Translations.

A theoretical study is presented of averaged standard masks for correlation-type automatic readers. Correlation coefficients can be calculated either by optical or electrical correlators. Formulas are developed for the optimum standards, which minimize the error probability, for both cases. When the total number of black elements in the standard is great, the use of the first type standard (optical) yields a much lower error probability. A 'hybrid' circuit is recommended for practical automatic readers.
AD-669 424 HC$3.00 MF$0.65

CYBERNETIC TECHNOLOGY (SELECTED ARTICLES).
Foreign Technology Div Wright-Patterson AFB Ohio
1 Sep 67, 46p Rept no. FTD-MT-24-134-67
Edited machine trans. of mono. Kiberneticheskaya Tekhnika, Kiev, 1965 p19-41, 59-70, 102-18.

Descriptors: (*Cybernetics, USSR), Reports, Computer storage devices, Magnetic tape, Circuits, Control systems, Electron tube parts, Current regulators, Magnetic cores, Response, Corrections, Reliability, Digital computers, Computer programs, Wiring diagrams, Periodic variations.

Contents: Stand for sampling matrices of magnetic memory elements on thin films; Tolerances of control currents in a cryothrone memory unit; Increasing ferrite memory unit access rate, by improving discharge circuits; Concerning the question of using the Hamming code to increase 3y reliability on magnetic tape; and Principles of construction of a digital correlator.
AD-669 430 HC$3.00 MF$0.65

APPLICATION OF THE NEAR-FIELD-ARRAY TECHNIQUE TO SONAR EVALUATION,
Naval Research Lab Orlando Fla Underwater Sound Reference Div
For primary bibliographic entry see Field 17A.
AD-669 433 HC$3.00 MF$0.65

HANDBOOK FOR MILITRAN ANALYSTS.
Final rept.,
Gulton Systems Research Group Inc Arlington Va
Thomas Giammo. 30 Apr 68, 195p
Contract Nonr-2936 (00)

Descriptors: (*Operations research, *Programming languages), Simulation, Mathematical models, Handbooks, Compilers, Compatibility, Programming (Computers), Input-output devices, War games, Bibliographies.
Identifiers: MILITRAN programming language.

This document is a guide for those involved in military operations research and emphasizes the methods and objectives of MILITRAN, an English-like compiler language used as a tool in the design of simulation models. (Author)
AD-669 438 HC$3.00 MF$0.65

PROGRAMMING LANGUAGES FOR DIGITAL WEAPON SYSTEMS: EVALUATION.
Evaluation rept. Nov 66-Apr 67,
Naval Electronics Lab Center for Command Control and Communications San Diego Calif
J. C. Tiernan. 18 Dec 67, 83p Rept no. NELC-1527

Descriptors: (*Programming languages, Weapon systems), Man-machine systems, Digital computers, Special purpose computers, Command + control systems, Compilers, Syntax, Learning, Digital systems.
Identifiers: Algol programming language, CS-1 programming language, SYCOL programming language, NELIAC programming language, COBOL, JOVIAL, FORTRAN.

The report considers programming languages from the viewpoint of digital weapon systems requirements. Machine-oriented and procedure-oriented languages are qualitatively compared. Also, a qualitative evaluation is made of the various procedure-oriented languages available. (Author)
AD-669 443 HC$3.00 MF$0.65

A PDP-8 FORTRAN PROGRAM FOR NEAR-FIELD ARRAY TESTING,
Naval Research Lab Orlando Fla Underwater Sound Reference Div
For primary bibliographic entry see Field 17A.
AD-669 449 HC$3.00 MF$0.65

CONTOUR, A FORTRAN PROGRAM TO PRODUCE CONTOUR MAPS FROM A MATRIX.
Picatinny Arsenal Dover N J Data Processing Systems Office
For primary bibliographic entry see Field 8B.
AD-669 485 HC$3.00 MF$0.65

THE BRACHISTOCHRONE PROBLEM SOLVED BY INVARIANT IMBEDDING, DYNAMIC PROGRAMMING AND QUASILINEARIZATION METHODS.
Houston Univ Tex Dept of Mechanical Engineering
For primary bibliographic entry see Field 12A.
AD-669 496 HC$3.00 MF$0.65

MATHEMATICAL ASPECTS OF COMPUTER SCIENCE,
American Mathematical Society Providence R I
J. T. Schwartz. 1967, 257p
AFOSR-68-1019
Contract AF 49 (638)-1667
Proceedings of Symposia in Applied Mathematics, Mathematical Aspects of Computer Science, v19 p1-244 5-7 Apr 66, New York.
Availability: Available from American Mathematical Society, Providence, R. I.

Descriptors: (*Computers, Symposia), (*Computer logic, Mathematical analysis), Documentation, Handbooks, Set theory, Automata, Computer programs, Accuracy, Programming languages, Number theory, Inequalities, Linear systems, Topology, Programming (Computers), Theorems, Linguistics, Algebras, Hydrodynamics, Polynomials, Analytic functions, Reports.
Identifiers: Spectral sequences.

Contents: A review of automatic theorem-proving; Assigning meanings to programs; Correctness of a compiler for arithmetic expressions; Context-free languages and Turing machine computations; Computer analysis of natural languages; The use of computers in the theory of numbers; A machine calculation of a spectral sequence; Numerical hydrodynamics of the atmosphere; The calculation of zeros of polynomials and analytic functions; Mathematical theory of automata; and Linearly unrecognizable patterns.
AD-669 507 Not available from CFSTI.

SOME PROBLEMS IN THE EVALUATION OF EXTERNAL-ACCESS WRITE-READ FERRITE STORAGE DEVICES (NEKTORYE VOPROSY OTSENKI SISTEM ZAPISI-CHTENIYA ZAPOMINAYUSHCHIKH USTROISTV NA FERRITAKH S VNESHNIM VYBOROM),
Foreign Technology Div Wright-Patterson AFB Ohio
V. N. Sorokin, and N. P. Vashkevich. 7 Jul 67, 20p Rept no. FTD-HT-23-915-67
Unedited rough draft trans. of Politekhnicheskii Institut, Penza. Uchenye Zapiski (USSR) n1 p3-16 1964, by J. Miller.

Descriptors: (*Magnetic core storage, Performance (Engineering)), Ferrites, Hysteresis, Reliability, Computer logic, USSR.
Identifiers: Translations.

The operation of a square-loop-ferrite storage element is investigated; two or more cores linked together are required for each binary digit. The core operation is described by a system of equations, and formulas are given for turnover currents, which allow for the turnover-current front-rise time. These formulas permit evaluating the effect of core parameters and link resistance on the speed of operation. Various modifications of the write-read systems are compared by the complexity of their control circuits, the number of exciting devices for number-link access, by their rates and the requirements of exciting fields under write-read conditions. The results of analysis are tabulated.
AD-669 508 HC$3.00 MF$0.65

A MEMORY UNIT FOR A 16,000 CHANNEL MULTIDIMENSIONAL ANALYZER (ZAPOMINAYUSHCHEE USTROISTVO DLYA MNOGOMERNOGO ANALIZATORA NA 16000 KANALOV),
Foreign Technology Div Wright-Patterson AFB Ohio
N. V. Meshkov, P. V. Nesterov, V. I. Smirnov, and A. M. Shimanskii. 6 Jul 67, 18p Rept no. FTD-HT-23-960-67
Unedited rough draft trans. of mono. Radiotekhnika n.p., 1963 p62-71, by J. Miller.

Descriptors: (*Computer storage devices, USSR), Data storage systems, Magnetic core storage, Magnetic cores, Magnetic tape, Data processing systems, Display systems, Ferrites.
Identifiers: Translations, Ferrite memory core, *Multidimensional analyzers.

Multidimensional analysis requires a large capacity memory and for this purpose magnetic tape is considered most expedient. However, lack of control over information during storage and the need for additional processing using a sorter are considered substantial disadvantages of magnetic tape recording. The authors constructed a 16000-address ferrite core storage which can operate either directly as the memory of the multidimensional analyzer or as a sorter for processing magnetic tape data. The large memory makes it possible, in a number of cases, in one pass to transcribe all information from one or several tapes and obtain a graphic picture of the spectrum. In this report they provide the characteristics of the memory and describe the operation of its individual elements. (Author)
AD-669 516 HC$3.00 MF$0.65

OPTICAL MEMORY UNIT (OPTICHESKOE ZAPOMINAYUSHCHEE USTROISTVO),
Foreign Technology Div Wright-Patterson AFB Ohio
S. N. Sokolov. 20 Jul 67, 7p Rept no. FTD-HT-23-932-67
Unedited rough draft trans. of Patent (USSR) 185 367, 22 Apr 65, 2p, by J. Anderson.

Descriptors: (*Computer storage devices, Coherent radiation), Data storage systems, Lasers, Reliability, Patents, USSR.
Identifiers: Translations.

The report describes an optical memory unit consisting of controlled light sources, a write information register, a photodisk, and light seasors. The coherent monochromatic light sources are placed in front of the photodisk and are coupled to the register containing the information to be stored. The coherent reference source is placed in front of an etched glass while the light sensors are located at the focal points of the system behind the photodisk. The advantages of this memory are its reliability and the increased write information density permitted by superimposing the stored information.
AD-669 521 HC$3.00 MF$0.65

STORAGE DEVICE WITH INTERCHANGEABLE CYLINDRICAL FERROMAGNETIC FILMS WITH WIRE BACKING (NAKOPITEL NA SMENNYKH FERROMAGNITNYKH TSILINDRICHESKIKH PLENKAKH S PROVOLOCHNOI PODLOZHKOI),
Foreign Technology Div Wright-Patterson AFB Ohio
L. A. Grigoryan, R. A. Turyan, G. A. Azaryan, and E. G. Manucharyan. 21 Jul 67, 7p Rept no. FTD-HT-23-930-67
Unedited rough draft trans. of Patent (USSR) 185 568, 12 Jul 65 2p, by J. Anderson.

Descriptors: (*Thin film storage devices, Ferromagnetic materials), Cylindrical bodies, Data storage systems, Patents, USSR.
Identifiers: Magnetic films, Translations.

An Author Certificate has been issued for a storage device with interchangeable ferromagnetic cylindrical film and a wire backing. The storage assembly is simplified by using side switching plates with tubular contacts. Different plates are used for odd and even outputs.
AD-669 524 HC$3.00 MF$0.65

RANDOM SEARCH IN OPTIMIZATION PROBLEMS FOR MULTIPARAMETER SYSTEMS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13H.
AD-669 542 HC$3.00 MF$0.65

FORECAST OF NUMERICAL CONTROL TECHNOLOGIES,
Edgewood Arsenal Md
For primary bibliographic entry see Field 13H.
AD-669 598 HC$3.00 MF$0.65

IGRAPH-A PROGRAM FOR ISOMETRIC PLOTTING.
Technical rept.,
Picatinny Arsenal Dover N J Feltman Research Labs
James H. Fahs. Feb 68, 40p*
PA-TR-3679

Descriptors: (*Subroutines, *Graphics), Mapping, Instruction manuals, Computer programs, Digital computers, Plotters.
Identifiers: IGRAPH computer program, Calcomp plotters, Isometric projection.

A description is given of a set of FORTRAN subroutines which will plot, in isometric projection, a surface defined by two independent variables. The six subroutines, collectively known as IGRAPH, are called by the users main program and in turn call upon the library routines prepared for the CALCOMP plotter. Sufficient instructions are given to allow the IGRAPH routines to be used, along with examples of plots prepared by these routines. For those desiring more details the basic operation of each routine is described and listings are included. (Author)
AD-669 605 HC$3.00 MF$0.65

BROADBAND LASER DISPLAY SYSTEM.
Army Electronics Command Fort Monmouth N J
For primary bibliographic entry see Field 20F.
AD-669 607 HC$3.00 MF$0.65

PROGRAM BEHAVIOR AND CONTROL IN VIRTUAL STORAGE COMPUTER SYSTEMS.
Technical rept.,
Michigan Univ Ann Arbor
Tad Brian Pinkerton. Apr 68, 171p Rept no. TR-4
Contract DA-49-083-OSA-3050
Rept. on Proj. CONCOMP. See also Technical report no. 3, AD-668 404.

Descriptors: (*Computer programs, Optimization), (*Computer storage devices, Control systems), Programming (Computers), Mathematical models, Simulation, Scheduling, Multiple operation, Stochastic processes, Efficiency, Time sharing, Data processing systems, Algorithms, Theses.
Identifiers: CONCOMP project, Storage allocation.

This study attempts to resolve some problems in the allocation of storage to computer programs. In both large and small systems, it is necessary to periodically transfer parts of programs between main and auxiliary storage devices. Several stochastic models are used to represent the behavior of programs with respect to their use of storage. These models are used to suggest ways in which main storage should be allocated in order to maximize the efficiency of the operating system. Both packaging the parts of a program into memory units and scheduling the storage assignment events during execution are considered as optimization problems. A detailed set of data from a particular large timesharing system was taken to illuminate the storage use characteristics of the system load and provide parameter values for the theoretical models. In addition, these data were used directly in a simulation study of storage management techniques which served to bridge the gap between simple analytical models and the complexities of a real system. (Author)
AD-669 686 HC$3.00 MF$0.65

SEMIANNUAL PROGRESS REPORT NO. 75, COVERING PERIOD JULY 1, 1967 - DECEMBER 31, 1967.
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
For primary bibliographic entry see Field 20N.
AD-669 693 HC$3.00 MF$0.65

A FORTRAN II PROGRAM FOR MUDAID: MULTIVARIATE, UNIVARIATE, AND DISCRIMINANT ANALYSIS OF IRREGULAR DATA,
Illinois Univ Urbana Dept of Psychology
For primary bibliographic entry see Field 12A.
AD-669 696 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY-BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME I. USER'S MANUAL.
Douglas Aircraft Co., Inc., Long Beach, Calif.
For primary bibliographic entry see Field 1A.
AD-817 158 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME II. PROGRAM FORMULATION AND LISTINGS.
Douglas Aircraft Co., Inc., Long Beach, Calif.
For primary bibliographic entry see Field 1A.
AD-817 159 HC$3.00 MF$0.65

MOESSBAUER-EFFECT DATA-COLLECTION SYSTEM,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 20H.
For abstract, see NSA 22 10.
ANL-7386 HC$3.00 MF$0.65

COMPUTER CENTER OF LATVIAN STATE UNIVERSITY DESCRIBED,
Joint Publications Research Service, Washington, D. C.
Ilya Lyumkis. 8 Feb 68, 9p
Trans. from Sovetskaya Latviya (Latvian SSR) p2 12 Nov 1967.

Descriptors: (*Computers, USSR), History, Predictions, Growth, Personnel, Volume, Money, Manpower studies, Universities.
Identifiers: Latvia.
JPRS-33292 HC$3.00 MF$0.65

PUNCHED CARD PRESCRIPTION ANALYSIS AND COST ACCOUNTING OF PHARMACIES,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 6O.
JPRS-44354 HC$3.00 MF$0.65

THE PROGRAMMERS HANDBOOK. A COMPENDIUM OF NUMERICAL ANALYSIS UTILITY PROGRAMS,
Union Carbide Corp., Oak Ridge, Tenn. Computing Technology Center.
For primary bibliographic entry see Field 12A.
For abstract, see NSA 22 10.
K-1729 HC$3.00 MF$0.65

TERMTRAN A PROGRAMMING SYSTEM FOR ENGINEERING CALCULATIONS VIA REMOTE TERMINALS,
Union Carbide Corp., Oak Ridge, Tenn. Computing Technology Center.
G. B. Knight, and R. E. Neu. 23 Feb 68, 53p
Contract W-7405-eng-26

Descriptors: (*Programming (Computers), Remote control systems), Compilers, Data processing systems, Programming languages.
Identifiers: Termtran compiler language, Multiprogramming, IBM 360 computers.

For abstract, see NSA 22 10.
K-1735 HC$3.00 MF$0.65

AXISYMMETRIC TWO-PHASE REACTING GAS NONEQUILIBRIUM NOZZLE FLOWS ANALYSIS.
TRW Systems Group, Redondo Beach, Calif.
For primary bibliographic entry see Field 20D.
For abstract, see STAR 06 12.
N68-21867 HC$3.00 MF$0.65

STABILITY CRITERIA FOR THE OAO COARSE POINTING MODE, PART 2 FINAL REPORT.
General Electric Co., Philadelphia, Pa. Grumman Aircraft Engineering Corp., Bethpage, N. Y. Missile and Space Div.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 06 12.
N68-21899 HC$3.00 MF$0.65

MERCURY MINIJOSS (A SMALL-SCALE, COMPUTER MULTI-ACCESS SYSTEM) - HARDWARE IMPLEMENTATION AND BASIC PROGRAM CONTROL OF INPUT/OUTPUT TRANSFERS.
Royal Aircraft Establishment, Farnborough (England).
K. Sanderson. Nov 67, 37p RAE-TR-67235

Descriptors: *Computers, *Hardware, *Input, *Output, Automatic control, Computer programming, Teleprinters.

For abstract, see STAR 06 12.
N68-21906 HC$3.00 MF$0.65

FEASIBILITY STUDY FOR RELIABLE MAGNETIC CONNECTION SWITCH, PHASE 2 FINAL REPORT.

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Stanford Research Inst., Menlo Park, Calif.
E. K. Van De Riet. Feb 68, 65p NASA-CR-94324
Contracts NAS7-100, JPL-951232
Prep- Prepared for Jpl

Descriptors: *Breadboard models, *Computers, *Fail-safe systems, *Magnetic switching, *Spacecraft electronic equipment, Electrical faults, Structural design, Switching circuits.

For abstract, see STAR 06 12.
N68-22342 HC$3.00 MF$0.65

A SPACECRAFT ANALOG-TO-DIGITAL CONVERSION SYSTEM EMPLOYING MOSFETS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
D. C. Lokerson. Mar 68, 30p NASA-TM-X-63175, X-711-68-91

Descriptors: *Analog to digital converters, *Field effect transistors, *Imp, *Metal oxide semiconductors, Accumulators (computers), Multivibrators, Oscillators, Temperature effects, Voltage regulators, Waveforms.

For abstract, see STAR 06 12.
N68-22400 HC$3.00 MF$0.65

OPTIMIZATION OF DESIGN OF SPACE EXPERIMENTS FROM THE STANDPOINT OF DATA PROCESSING SEMIANNUAL REPORT, 1 OCT. 1967 - 31 MAR. 1968.
California Univ., Berkeley. Space Science Lab.
V. R. Algazi, D. J. Sakrison, and S. Silver. 31 May 68, 13p NASA-CR-94331
Contract NGR-05-003-143
Seri- Its Ser. 9, Issue 22

Descriptors: *Airborne equipment, *Computer design, *Onboard equipment, *Spacecraft electronic equipment, Algorithms, Coding, Computer components, Data processing, Digital techniques, Error analysis, Information theory, Random noise.

For abstract, see STAR 06 12.
N68-22422 HC$3.00 MF$0.65

ASSOCIATIVE MEMORIES IN NUCLEAR PHYSICS.
les Memoires Associatives en Physique Nucleaire
Commissariat A L Energie Atomique, Saclay (France).
E. Blanca, and A. Carriere. Dec 67, 43p CEA-R-3394
Lang- in French

Descriptors: *Computer programming, *Computer storage devices, *Nuclear research, Buffer storage, Channels, Data processing, Data processing equipment, Magnetic storage.

For abstract, see STAR 06 12.
N68-22553 HC$3.00 MF$0.65

A COMPUTER CODE FOR STORING AND RETRIEVING DATA AND DEVELOPING IMPROVED SOLIDS FOR FIXATION OF HIGHLY RADIOACTIVE WASTES,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18G.
For abstract, see NSA 22 10.
ORNL-3824-Suppl-1 HC$3.00 MF$0.65

ELECTRONIC COMPUTER STUDY.
Washington State Dept. of Highways.
Feb 68, 37p*
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Descriptors: (*Roads, Research program administration), (*Computers, Roads), History, Engineering, Geometry, Bridges, Traffic, Soil mechanics, Materials, Programming languages, Computer programs, Washington (State), Design, Construction.
Identifiers: Computer aided design, FORTRAN, IBM 650, IBM 1620.

The report summarizes the research effort of the Washington Department of Highways during a ten year period from 1956 to 1966. It describes the evolution of highway application programs from the initial development phase on IBM-650 computer to the more advanced IBM-1620 system including the CalComp line plotter. During this period the computer program development has been concentrated on the following areas: (1) Highway Engineering; (2) Geometry; (3) Bridge Engineering; (4) Traffic; and (5) Soil Mechanics and Materials. The majority of programs have been developed in FORTRAN II programing language. The complete list of 140 programs is included in the report. (BPR Abstract)
PB-177 999 HC$3.00 MF$0.65

THE FLEXICON: AN APPROACH TO A LOW COST MEDICAL DISPLAY FOR COMPUTER PROCESSED DATA.
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
For primary bibliographic entry see Field 6E.
PB-178 065 HC$3.00 MF$0.65

ELECTRONIC DATA PROCESSING BRIEF.
Metropolitan Atlanta Council of Local Governments, Ga.
Jan 68, 49p

Descriptors: (*Urban planning, Data processing systems), (*Urban areas, Operations research), Time sharing, Safety, Decision making, Costs, Money, Law, Education, Commerce, Information retrieval, Effectiveness, Programming (Computers), Management planning, Population, Distribution, Public health, Industries.

The report is on the status of electronic data processing as an intergovernmental project within MACLOG. Many units of government have developed EDP capabilities. There are examples where these capabilities are shared with other governments. This report is concerned with these cooperative efforts. The account falls easily into two sections. The first, a history of one group's effort to design and plan for a metropolitan system designed to meet the needs of the region. The second, the record of another group's effort to make the maximum use, in the minimum time, of EDP capabilities being made available to meet certain limited needs. (Author)
PB-178 066 HC$3.00 MF$0.65

COMPUTER PROGRAMMING DEVELOPMENT,
California State Div. of Highways. Computer Systems Dept.
For primary bibliographic entry see Field 13B.
PB-178 087 HC$3.00 MF$0.65

COMPUTER SCIENCE AND EDUCATION.
Stanford Univ., Calif. Dept. of Computer Science.
For primary bibliographic entry see Field 5I.
PB-178 115 HC$3.00 MF$0.65

EXPANDED STUDY OF DATA PROCESSING AND COMPRESSION TECHNIQUES,
Thomas Bede Foundation, Los Altos, Calif.
For primary bibliographic entry see Field 5B.
For abstract, see NSA 22 10.
SC-CR-67-2864 HC$3.00 MF$0.65

SORS CONTE CARLO PHOTON-TRANSPORT CODE FOR THE CDC 6600,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 20H.
For abstract, see NSA 22 10.
UCRL-50358 HC$3.00 MF$0.65

9C. Electronic and Electrical Engineering

SEMIANNUAL PROGRESS REPORT NO. 75, COVERING PERIOD JULY 1, 1967 - DECEMBER 31, 1967.
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
For primary bibliographic entry see Field 20N.
AD-669 693 HC$3.00 MF$0.65

FRAUNHOFER LINE DISCRIMINATOR FINAL REPORT.
Perkin-elmer Corp., Norwalk, Conn. Optical Group.
H. Ludwig, D. Markle, and G. Schlesinger. 15 Apr 68, 117p NASA-CR-92065, REPT.-9148
Contract NAS9-7447

Descriptors: *Airborne equipment, *Discriminators, *Fraunhofer lines, *Optical measuring instruments, Bandpass filters, Electronic equipment tests, Fluorescence, Maintenance, Solar spectra, Systems engineering.

For abstract, see STAR 06 12.
N68-21919 HC$3.00

A REVIEW OF LUBRICATION OF SLIDING AND ROLLING ELEMENT ELECTRICAL CONTACTS IN VACUUM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
For primary bibliographic entry see Field 11H.
For abstract, see STAR 06 12.
N68-21979 HC$3.00 MF$0.65

OPTIMAL CONTROL OF LINEAR STOCHASTIC SYSTEMS WITH MEASUREMENT ERRORS.
Massachusetts Inst. of Tech., Cambridge. Experimental Astronomy Lab.
J. J. Deyst, Jr.. Feb 68, 28p NASA-CR-94291, RE-40
Contract NGR-22-009-207

Descriptors: *Feedback control, *Optimal control, *Statistical analysis, *Stochastic processes, Costs, Error functions, Functional analysis, Linear systems.

For abstract, see STAR 06 12.
N68-22015 HC$3.00 MF$0.65

ABSOLUTE STABILITY AND PARAMETER SENSITIVITY.
Santa Clara Univ., Calif.
D. Siljak. 26 Apr 68, 11p NASA-CR-73218
Contract NGR-05-017-010

Descriptors: *Automatic control, *Control stability, *Dynamic control, *Sensitivity, Dynamic response, Feedback control, Frequency response, Systems analysis.

For abstract, see STAR 06 12.
N68-22440 HC$3.00 MF$0.65

CONSIDERATIONS ON A DIRECT SPECTRAL METHOD OF IDENTIFICATION LINEAR SYSTEMS.
Considerazioni Su Un Metodo Spettrale Diretto Per l'Identificazione Dei Sistemi Lineari
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
A. Garroni. Feb 68, 102p EUR-3734.1
Refs Lang- in Italian, English Summary

Descriptors: *Harmonic functions, *Linear systems, *Power spectra, *Spectral energy distribution, Digital computers, Fourier analysis, Harmonic analysis, Signal analysis, Spectral resolution, Transfer functions.

For abstract, see STAR 06 12.
N68-22679 HC$3.00 MF$0.65

LYAPUNOV CONTROL-SYSTEM SYNTHESIS OF A HIGHLY RESONANT PLANT.
Connecticut Univ., Storrs. School of Engineering.
D. W. Jorgenson, Jr., and D. P. Lindorff. Apr 68, 34p NASA-CR-94421
Grant NSG-309

Descriptors: *Control equipment, *Liapunov functions, *Resonant vibration, *Systems analysis, Equations of motion, Equipment specifications, Feedback control, Mathematical models, Systems engineering.

For abstract, see STAR 06 12.
N68-22774 HC$3.00 MF$0.65

9D. Information Theory

QUARTERLY PROGRESS REPORT NO. 89,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
For primary bibliographic entry see Field 5B.
AD-669 231 HC$3.00 MF$0.65

ON THE QUESTION OF DIGITAL PERCEPTRON SYNTHESIS (K VOPROSU SINTEZA DISKRETNOGO PERSEPTRONA),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9B.
AD-669 270 HC$3.00 MF$0.65

CHANNEL SIMULATION-DIGITAL VS. ANALOG.
Institute for Telecommunication Sciences Boulder Colo
For primary bibliographic entry see Field 20N.
AD-669 283 MF$0.65

ON OPTIMAL AND SUBOPTIMAL LINEAR SMOOTHING.
Technical rept.,
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
R. K. Mehra. Mar 68, 36p Rept no. TR-559
Contract N00014-67-A-0298, Grant NGR-22-007-068

Descriptors: (*Information theory, Numerical analysis), Optimization, Vector spaces, Statistical processes, Sensitivity, Random variables, Errors, Theorems.
Identifiers: Sensitivity analysis, Kalman filters, Optimal smoothing.

Recursive form of results on smoothing for linear dynamic systems were first given by Bryson and Frazier (1962). Alternate formulations of the problem were given by Rauch et al (1965), Mayne (1966), Fraser (1967) and Kailath (1968). The present report shows that the results of Mayne and Fraser can be derived in a more general setting using the Orthogonality Principle of Linear Estimation. The form of the results is particularly useful for the sensitivity analysis of the optimal smoother. Explicit equations are derived for the actual covariance of a suboptimal smoother which uses wrong information about the mean square values of noise inputs. Conditions are established under which the calculated values of the covariances provide upper bounds on the actual covariances of the smoothed estimates. (Author)
AD-669 510 HC$3.00 MF$0.65

OPTIMAL NONLINEAR FILTERING FOR INDEPENDENT PROCESSES, PART II.
Revised ed.,
California Univ Los Angeles Dept of Engineering
J. R. Fisher, and E. B. Stear. 1 Apr 67, 12p
AFOSR-68-0918-Pt-2
Contract AF-AFOSR-699-65
Revision of report dated 7 Jul 66. See also Part I, AD-668 784.
Availability: Published in IEEE Transactions on Information Theory, vIT13 n4 p568-78 Oct 1967.

Descriptors: (*Information theory, Nonlinear systems), Probability density functions, Statistical processes, Integral transforms, Power series, Optimization, Theorems.
Identifiers: Gaussian noise, Optimal nonlinear filtering, Nonlinear filtering.

The main result obtained in Part I is generalized and extended in several ways. A new basic stochastic integro-partial differential equation for the condition probability density function for the state of a nonlinear dynamic system with distturbance noise given noisy nonlinear measurements of the state is derived under the less restrictive assumption that the disturbance noise is an arbitrary independent increment process with an infinitely divisible distribution. It is shown that, under proper restrictions, this basic equation reduces to either the Fokker-Planck equation for diffusion processes or the Kolmogorov-Feller equation for jump processes. Also, it is shown that this basic equation contains the earlier results of Kushner and Wonham as special cases. Next, it is shown how the result represented by this basic equation can be easily extended to include the case where the disturbance noise is a Markov process of the type initially assumed for the state of the dynamic system. Finally, it is shown that, in contrast to results obtained by Bryson and Johansen and Cox for the linear, Gaussian case, it is not generally possible to extend the result represented by this basic equation too include either the case where the measurement noise is a Markov process of the type initially assumed for the state of the dynamic system, or the case where the covariance matrix of the Gaussian measurement noise is singular. However, some incomplete results indicating when such extensions might be possible are given. (Author)
AD-669 640 Not available from CFSTI.

ROLE OF INFORMATION THEORY ILLUSTRATED,
Joint Publications Research Service, Washington, D. C.
V. Siforov. 18 Jan 68, 6p
Trans. of Nedelya (USSR) n46 p5-11 1967.

Descriptors: (*Information theory, USSR), History, Scientific research, Eye, Electronics, Pattern recognition, Miniature electronic equipment.
JPRS-44071 HC$3.00 MF$0.65

9E. Subsystems

STUDY OF DISTORTION IN KLYSTRONS AND TRAVELINGWAVE TUBES.
Quarterly progress rept. no. 4, 1 Mar-31 May 64.
Watkins-Johnson Co., Palo Alto, Calif.
May 64, 29p
Contract DA-36-039-AMC-02321 (E)

Descriptors: (*Traveling wave-tubes, Distortion), (*Klystrons, Distortion), L band, Measurement, Electron tube parts, Design, Radiofrequency power, Electron beams, Focusing, Backward wave-tubes, Microwave amplifiers.

Experimental results on a PPM focused WJ-237, a 2.5 watt L-band TWT are given. These include continued balanced two-tone intermodulation tests, unbalanced two-tone intermodulation and cross modulation tests, and effects of collector depression on balanced two-tone power output. The results of modifying the helix support sleeves are given. A measurement of single tone harmonic power output with uncompensated coupling is presented. (Author)
AD-446 426 HC$3.00

DIRECT DIGITAL CONTROL INVESTIGATION,
Boeing Co Renton Wash Commercial Airplane Div
C. A. Benet. 25 Oct 67, 66p Rept no. D6-20691

Descriptors: (*Control systems, Digital systems), Hydraulic systems, Mathematical models, Flow charting, Costs, Programming (Computers), Servomechanisms, Feedback, Sampling, Reliability, Integral transforms, Programming languages, Algorithms, Supersonic flight, Aerodynamic heating, Aerodynamic loading, Heat flux.
Identifiers: Graphs (Charts), Closed-loop control systems, *Direct digital control systems, Equivalent circuits.

The purpose of this report is to determine the feasibility of applying Direct Digital Control (DDC) to laboratory test control systems and maintain competance in the electro-hydraulic control field. (Author)
AD-669 205 HC$3.00 MF$0.65

DERIVATION OF SIGNAL-LEVEL CONSTRAINTS FOR A DIGITAL CIRCUIT.
Progress rept. no. 2,
Army Electronics Command Fort Monmouth N J Communications/Adp Lab
William C. Cave. Nov 67, 28p
ECOM-2888
Report on Techniques for Automated Circuit Design.

Descriptors: (*Logic circuits, Design), Digital systems, Signals, Voltage, Noise, Gates (Circuits), Transfer functions, Inequalities.
Identifiers: Computer aided design.

Generalized expressions of constraints on the signal levels of a digital circuit are derived. These constraints are expressed in terms of expected noise and element tolerances. A simplification of these constraints is provided based on the theory of envelopes. It is then demonstrated how these constraints can be transformed into constraints on the nominal circuit variables. (Author)
AD-669 235 HC$3.00 MF$0.65

PRINTED CIRCUIT CONNECTORS FOR MICROASSEMBLIES.
Rept. no. 2 (Final) 1 Jan 65-3 May 67,
Cinch Mfg Co Chicago Ill
Howard E. Dwan. Feb 68, 113p*
ECOM-00294-F
Contract DA-28-043-AMC-00294 (E)

Descriptors: (*Circuit interconnections, *Printed circuits), Modules (Electronics), Microminiaturization (Electronics), Disks, Hermetic seals, Encapsulation, Reliability (Electronics).

The Report documents the research and development effort of a program for the study of four microassembly connector designs. These connector designs are (1) Receptacle for the hermetic sealed Micro Circuit Module (MCM), (2) Encapsulated MCM header and receptacle - 36 contacts, (3) Encapsulated MCM header and receptacle - 80 contacts and (4) MCM Microwafer test socket. The development and evaluation of these four connector designs are documented in this report. Included are design drawings and a summary of the test results. A receptacle design for the twenty pin MCM was fabricated using production type tooling and was demonstrated to be suitable for Military equipments. A unique test socket for the testing of MCM Microwafers was also designed, fabricated and demonstrated to meet the full requirements of the program. Models of the 36 and 80 contact MCM header and receptacle connectors fabricated using production type tooling did not meet the specified requirements. The primary problem with these connectors was concluded to be the variation inherent in raw contact material and the difficulty to control fabrication of the minute contacts required for the application. (Author)
AD-669 256 HC$3.00 MF$0.65

THE AIRCRAFT INTEGRATED DATA SYSTEM, ACIDS.

Parks Coll of Aeronautical Technology East St Louis Ill
For primary bibliographic entry see Field 1C.
AD-669 262 HC$3.00 MF$0.65

A DEVICE FOR MASS EKG EXAMINATION OF THE POPULATION (USTROISTVO DLYA MASSOVOGO ELEKTROKARDIOGRAFICHESKOGO OBSLEDOVANIYA NASELENIYA),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 6E.
AD-669 267 HC$3.00 MF$0.65

HETEROJUNCTION DEVICES.
Syracuse Univ N Y Dept of Electrical Engineering
For primary bibliographic entry see Field 9A.
AD-669 365 HC$3.00 MF$0.65

NETWORK FUNCTION SYNTHESIS USING NON-IDEAL GROUNDED AMPLIFIERS AND RC ONE-PORTS.
Technical rept.,
New York Univ N Y Lab for Electroscience Research
Murray Goldman, and Mohammed S. Ghausi.
Dec 67, 52p Rept nos. Scientific-9, TR-400-174 AFCRL-68-0111
Contract AF 19 (628)-5537

Descriptors: (*Transfer functions, Synthesis), (*Integrated circuits, Synthesis), Admittance, Amplifiers, Low-pass filters, Inductance, Gain, Bandwidth, Electrical impedance.
Identifiers: Circuit theory, Network synthesis, Butterworth filters.

A configuration containing 3 practical grounded amplifiers and passive RC one-ports which is capable of synthesizing any general lumped network function is derived. The network function specification can be in the form of a driving-point immittance function or any of the four forms of transfer functions. Non ideal controlled source models and the source and load impedances are explicitly included in the configuration, thus making its usage especially attractive from a practical viewpoint. Of particular interest is that complete compensation for the poles of the high gain amplifiers is achieved in the synthesis procedure. Thus one can obtain high gains with practical element values without loss of bandwidth. (Author)
AD-669 374 HC$3.00 MF$0.65

AN/GPA-123 SUM AND DIFFERENCE ANTENNA GROUP.
Technical rept.,
Rome Air Development Center Griffiss AFB N Y
Frank T. Benvenga. Apr 68, 52p Rept no. RADC-TR-68-140

Descriptors: (*Radar antennas, Target recognition), Antenna radiation patterns, Theory, Radiofrequency filters, Antenna components, Electronic switches, Coupling circuits, Radar equipment, Low-pass filters, Standing wave ratios, Attenuation, Polarization, Reliability (Electronics), Maintainability, Environmental tests.
Identifiers: AN/GPA-133, Beam width, Sum and difference antennas, Diplexers, Interrogation side lobe suppression, ISLS (Interrogation Side Lobe Suppression).

Prior to this development Interrogation Side Lobe Suppression (ISLS) was accomplished with the use of two separate antennas; a directional and an omnidirectional antenna. The same results, however, can be achieved through the use of a single directional antenna which can produce two distinct patterns. The sum and difference patterns are obtained by feeding the antenna in two halves by means of a hybrid junction. This system also has an additional benefit of effectively sharpening the beamwidth when interrogating ISLS equipped airborne transponders. A trade-off is necessary, however, in that the one antenna system is more complex and requires a greater degree of precision. Operational tests conducted indicate that the development effort was successful and ISLS is possible using this system. Requirements of the specification and design objectives were for the most part achieved. (Author)
AD-669 386 HC$3.00 MF$0.65

THE CURRENT PRINCIPLE OF TRANSISTOR APPLICATION (TOKOVYI PRINTSIP ISPOLZOVANIYA TRANZISTORA),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9A.
AD-669 426 HC$3.00 MF$0.65

CYBERNETIC TECHNOLOGY (SELECTED ARTICLES).
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9B.
AD-669 430 HC$3.00 MF$0.65

ENGINEERING EVALUATION OF NAFI STANDARD HARDWARE MODULES.
Technical rept. (Final),
Naval Avionics Facility Indianapolis Ind
T. Smith. 30 Nov 67, 71p Rept no. NAFI-TR-1094

Descriptors: (*Modules (Electronics), Environmental tests), Aircraft equipment, Logic circuits, Electric wire, Temperature, Humidity, Vibration, Shock (Mechanics), Salt spray tests.
Identifiers: Wire wrap connections, Graphs (Charts).

Twenty-six NAFI Type 3 Standard Hardware (SHP) Modules, mounted in a NAFI plug-in module mounting fixture were subjected to engineering evaluation tests. The back panel wiring of the module assembly, specifically the wire wrap connections, was also evaluated. The environmental tests included: temperature, thermal shock, salt fog, and humidity.
AD-669 460 HC$3.00 MF$0.65

A SYSTEM FOR IDENTIFYING CHANNELS OF A PULSE ANALYZER MEMORY DATA DISPLAY.
Technical rept.,
Illinois Univ Urbana Dept of Physics
Robert A. Hoffswell. May 68, 13p Rept no. TR-170
Contract N00014-67-A-0305

Descriptors: (*Pulse height analyzers, Oscilloscopes), Display systems, Cathode ray tubes, Identification, Intensity, Pulse systems, Logic circuits, Time, Gates (Circuits), Relaxation oscillators, Interfaces, Diagrams.
Identifiers: Multichannel analyzers.

A system is described which may be used in conjunction with the display mode of a multichannel analyzer for channel address determination. In this system a selected channel of the memory data display is intensified and the corresponding address is indicated by a decimal counter. Also presented is a channel identifier circuit to be used with a TMC 4096 analyzer. This circuit may be readily adapted for use with other analyzers through the use of simple interface equipment. (Author)
AD-669 495 HC$3.00 MF$0.65

A STABLE TRANSFORMERLESS LF AMPLIFIER (STABILNYI BESTRANSFORMATORNII USILITEL NCH),
Foreign Technology Div Wright-Patterson AFB Ohio
I. Akulinichev. 12 Jul 67, 8p Rept no. FTD-HT-23-945-67
Unedited rough draft trans. Radio, Moscow (USSR) n4 p28 1967, by J. Anderson.

Descriptors: (*Audio amplifiers, Stability), Television receivers, Design, Reliability (Electronics), USSR.
Identifiers: Translations.

The article describes a transformerless LF amplifier which the author considers highly reliable, having tested it for two years as an amplifier in a television set. Necessary circuitry is described. An evaluation of the amplifier is appended.
AD-669 522 HC$3.00 MF$0.65

PROSPECTS OF REDUCING INSULATION LEVELS IN NETWORKS AT 500 KV AND ABOVE,
Bonneville Power Administration, Portland, Oreg.
M. M. Akodis, A. A. Gritsuk, and V. N. Smetanin.
Oct 67, 13p BPA-Trans-7491
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Energetika (USSR) v9 n11 p1-8 1966.

Descriptors: (*Electric insulation, *Electrical networks), Voltage, Cost effectiveness, Design, Suppressors, Current limiters, Moisture, USSR.
Identifiers: Translations.

Development and mastering of the use of small modern insulators, both at home and abroad, permits us to reduce the length of chains on 500-kV lines, according to the action of the working voltage under the most unfavorable atmospheric conditions (dew, fog, hoar-frost) from 4.0-4.2 meters to 3.0-3.1 meters. In (1) a description is given of insulators which permit to use 3.05 meter long chains for 500-kV lines.
PB-178 160T HC$3.00 MF$0.65

9F. Telemetry

LASER TELEMETER FOR ARTILLERY PIECE.
Task rept. Sep 67-Feb 68,
ITT Avionics Nutley N J
L. M. Vallese, and Milner W. Wallace. Feb 68, 46p
Contract DA-28-017-AMC-3455 (A)

Descriptors: (*Projectiles, Telemetering transmitters), (*Telemetering transmitters, *Lasers), Telemeter systems, Artillery, Diodes (Semiconductor), Gallium arsenides, Design, Pulse position modulation, Pulse duration modulation, Diagrams, Photographs.
Identifiers: *Semiconductor lasers.

The work of design and fabrication of three Laser Telemeter units for artillery piece, having seven channels of IRIG telemetry and using a PPM GaAs laser, is described. In addition, the design of a PPM-to-PDM converter unit to be used in connection with detection and recording of the telemetry information is described. (Author)
AD-669 627 HC$3.00 MF$0.65

CONTINUOUS MEASUREMENTS OF THE FARADAY EFFECT USING CROSSED ANTENNAE.
Kiruna Geophysical Observatory (Sweden).
A. Wernik. Dec 67, 15p KGO-677

Descriptors: *Dipole antennas, *Faraday effect, *Polarization (waves), *Radio transmission, Antenna radiation patterns, Communication satellites, Polarization characteristics, Vector analysis, Wave propagation.

For abstract, see STAR 06 12.
N68-21870 HC$3.00 MF$0.65

FLIGHT TESTS OF A RADAR SCATTERING-COEFFICIENT MEASURING INSTRUMENT. PART I - SUMMARY.
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
J. A. Bosco, L. W. Counts, J. F. Reintjes, and J. R. Sandison. Feb 68, 31p NASA-CR-94224, ESL-R-340, PT. I
Grant NSG-234-61, Contract DSR-76343

Descriptors: *Flight tests, *Radar scattering, *Scattering coefficients, Electromagnetic measurement, Graphs (charts), Incidence, Measuring instruments, Superhigh frequencies, Terrain.

For abstract, see STAR 06 12.
N68-21892 HC$3.00 MF$0.65

A STUDY OF EARTH RADAR RETURNS FROM ALOUETTE SATELLITE.
Kansas Univ., Lawrence. Remote Sensing Lab.
R. C. Chia, H. H. Doemland, and R. K. Moore.
Apr 67, 35p NASA-CR-94294, CRES-37-1
Grant NSG-477

Descriptors: *Alouette satellites, *Ground stations, *Ionograms, *Radar echoes, Coefficients, Electromagnetic absorption, Ionospheric sounding, Numerical analysis, Signal reflection.

For abstract, see STAR 06 12.
N68-22044 HC$3.00 MF$0.65

REDUCTION OF SATELLITE TELEMETRY DATA.
European Space Data Centre, Darmstadt (West Germany).
W. Lloyd. Nov 66, 25p ESRO-TM-45
Coll- 25 P Refs Conf- Presented At the Esro Summer School, Oxford, 26 Aug. 1964

Descriptors: *Ariel 1 satellite, *Data reduction, *Telemetry, Analog to digital converters, Data correlation, Orbital elements, Time dependence.

For abstract, see STAR 06 12.
N68-22190 HC$3.00 MF$0.65

BACKFIRE YAGI ANTENNA MEASUREMENTS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
L. R. Dod. Dec 67, 52p NASA-TM-X-63173, X-525-67-604

Descriptors: *Antenna radiation patterns, *Yagi antennas, Dipole antennas, Graphs (charts), Impedance, Tables (data).

For abstract, see STAR 06 12.
N68-22276 HC$3.00 MF$0.65

SST TELEMETRY SIMULATOR.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
N. E. Roberts, and R. J. Stattel. Mar 68, 20p NASA-TM-X-63176, X-721-68-94

Descriptors: *Supersonic transports, *Telemetry, Calibrating, Demodulation, Ground stations, Pulse modulation, Servomechanisms, Signal processing, Simulators, Transponders.

For abstract, see STAR 06 12.
N68-22277 HC$3.00 MF$0.65

ADMITTANCE OF THE INFINITE CYLINDRICAL ANTENNA IN A LOSSY PLASMA. 3 - THE COMPRESSIBLE, MAGNETOPLASMA.
Michigan Univ., Ann Arbor. High Altitude Engineering Lab.
E. K. Miller. Oct 67, 57p NASA-CR-94345, REPT.-05627-13-S
Contract NASR-54/05/

Descriptors: *Anisotropy, *Dipole antennas, *Electrical impedance, *Plasmas (physics), Compressibility, Fourier transformation, Ionosphere, Magnetic fields, Mathematical models.

For abstract, see STAR 06 12.
N68-22321 HC$3.00 MF$0.65

AN AIRBORNE PULSE COUNTER AND SERIAL ENCODER.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
J. W. Fennel, J. F. Fitz, M. L. Moore, and R. J. Stattel. Sep 67, 29p NASA-TM-X-63172, X-721-67-469

Descriptors: *Coders, *Counters, *Delta launch vehicle, *Digital systems, *Pulses, Accelerometers, Airborne equipment, Radio telemetry, Timing devices, Waveforms.

For abstract, see STAR 06 12.
N68-22423 HC$3.00 MF$0.65

THE TEM RADIATION PATTERN OF A THIN-WALLED PARALLEL-PLATE WAVEGUIDE ANALYZED BY A SURFACE INTEGRATION TECHNIQUE.
Ohio State Univ., Columbus.
D. C. Wu. May 68, 52p NASA-CR-1052, REPT.-1691-23
Grant NSG-488
Coll- 52 P Refs

Descriptors: *Antenna radiation patterns, *Parallel plates, *Waveguides, Green function, Half spaces, Mathematical models, Slot antennas, Transverse waves, Wave diffraction.

For abstract, see STAR 06 12.
N68-22746 HC$3.00 MF$0.65

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

EFFECT OF DEGREE OF ADMISSION ON THE PERFORMANCE OF A CENTRIPETAL TURBINE (VLIYANIE STEPENI PARTSIALNOSTI NA RABOTU TSENTROSTREMITELNOI TURBINY),
Foreign Technology Div Wright-Patterson AFB Ohio
A. E. Kovalevskaya. 20 Oct 67, 13p Rept no. FTD-HT-23-828-67
Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Aviatsionnaya Tekhnika (USSR) n3 p141-8 1966.

Descriptors: (*Axial-flow turbines, Efficiency), Gas turbines, Nozzles, Performance (Engineering), USSR.
Identifiers: *Centripetal turbines, Translations.

The effect of the degree of partial admission epsilon on the turbine efficiency has been investigated experimentally in the range epsilon = 1 - 0.09. The schematic diagram and basic dimensions of the turbine tested are shown. Measurements were made of the total inlet pressure, static pressure in the radial clearance between the nozzle rings and the rotor, exist pressure, inlet and exit temperatures, and the shaft torque. Plots were obtained showing the relationship between the efficiency, the degree of reaction, and epsilon. The obtained results show that with a reduction in partial admission, the efficiency drops; at epsilon = 0.5, the efficiency is reduced by 10-15%. A further reduction in the degree of partial admission results in a sharp reduction in turbine efficiency. It was also found that the arrangement of nozzles in the inward-flow radial turbines with partial admission has no effect on turbine efficiency. (Author)
AD-669 310 HC$3.00 MF$0.65

FEASIBILITY STUDY OF A 30 WATTS PER POUND ROLL UP SOLAR ARRAY QUARTERLY TECHNICAL REPORT, 1 JAN. - 31 MAR. 1968.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Missile and Space Div.
F. A. Blake, K. F. Merten, and N. F. Shepard. 15 Apr 68, 138p NASA-CR-94243, DOC.-68SD4246
Contracts NAS7-100, JPL-951970
Prep- Prepared for Jpl

Descriptors: *Scale models, *Solar cells, *Solar collectors, *Thermal cycling tests, Arrays, Beryllium, Curl (materials), Drums (containers), Panels, Solar energy, Systems engineering.

For abstract, see STAR 06 12.
N68-21879 HC$3.00 MF$0.65

FEASIBILITY STUDY 30 WATTS PER POUND ROLLUP SOLAR ARRAY QUARTERLY REPORT, 1 JAN. - 31 MAR. 1968.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Ryan Aeronautical Co., San Diego, Calif.
15 Apr 68, 60p NASA-CR-94245, REPT.-40067-3
Contracts NAS7-100, JPL-951971
Prep- Prepared for Jpl

Descriptors: *Adhesives, *Drums (containers), *Solar cells, *Vibration tests, Dynamic structural analysis, Engineering drawings, Scale models, Structural design, Systems engineering.

For abstract, see STAR 06 12.
N68-21998 HC$3.00 MF$0.65

DEVELOPMENT OF ADVANCED SOLAR CELL MODULUS TECHNOLOGY FOR USE BY SOLAR PROBES AND LARGE AREA SOLAR CELL ARRAYS.
Entwicklung Von Fortschrittlichen Solarzellen Modultechnologien Unter Berucksichtigung Von Anwendungen Bei Sonnensonden Und Grossflaechi- Gen Solarzellenawlagen
Bolkow Entwicklungen K. G., Munich (West Germany).
K. Einfeld, E. Klippel, and E. Mueller. 1968, 54p RF-93-0, DGLR-68-003
Lang- in German Conf- Presented At the 2nd Dglr Symp. on Energy Supply in Interstellar Space, Munich, Mar. 1968 Spon- Supported in Part By the Bundesmin. Fuer Wiss. Forsch.

Descriptors: *Panels, *Solar cells, *Solar collectors, *Structural design, Brazing, Components, Metal bonding, Perforated plates, Solar energy absorbers, Solar probes, Soldering, Structural stability, Thermal stresses, Thin plates.

For abstract, see STAR 06 12.
N68-22010 HC$3.00 MF$0.65

PLANETARY SOLAR ARRAY DEVELOPMENT, VOLUME 3 QUARTERLY REPORT.
Electro-optical Systems, Inc., Pasadena, Calif. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
R. Wizenick. 15 Apr 68, 86p NASA-CR-94318, EOR-7254-Q-3, V. 3
Contracts NAS7-100, JPL-952035
Prep- Prepared for Jpl

Descriptors: *Arrays, *Solar cells, *Structural analysis, *Systems analysis, Antennas, Booms (equipment), Circuits, Mars environment, Performance tests, Spacecraft power supplies, Structural design.

For abstract, see STAR 06 12.
N68-22231 HC$3.00 MF$0.65

PLANETARY SOLAR ARRAY DEVELOPMENT, VOLUME 1 QUARTERLY REPORT.
Electro-optical Systems, Inc., Pasadena, Calif. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
R. Wizenick. 15 Apr 68, 154p NASA-CR-94320, EOS-7254-Q-3, V. 1
Contracts NAS7-100, JPL-952035
Prep- Prepared for Jpl

Descriptors: *Arrays, *Solar cells, *Structural analysis, *Systems analysis, Conical bodies, Eng-

ineering drawings, Instrument packages, Performance tests, Spacecraft power supplies, Structural design.

For abstract, see STAR 06 12.
N68-22232 HC$3.00

PLANETARY SOLAR ARRAY DEVELOPMENT, VOLUME 2 QUARTERLY REPORT.
Electro-optical Systems, Inc., Pasadena, Calif. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
R. Wizenick. 15 Apr 68, 105p NASA-CR-94319, EOS-7254-Q-3, V. 2
Contracts NAS7-100, JPL-952035
Prep- Prepared for Jpl

Descriptors: *Arrays, *Performance tests, *Solar cells, *Structural analysis, *Systems engineering, Circuits, Engineering drawings, Spacecraft power supplies, Structural design, Systems analysis.

For abstract, see STAR 06 12.
N68-22233 HC$3.00

ON THE CAUSES OF DISCONTINUITY IN STAGE CHARACTERISTICS OF AN AXIAL COMPRESSOR WITH A RELATIVELY LARGE HUB DIAMETER.
O Prichinakh Razryva Kharakteristik Stupeni Osevogo Kompressora S Bol'shim Otnositel'nym Diametrom Vtulki
Scripta Technica, Inc., Washington, D. C.
G. A. Borisov, E. A. Lokshtanov, and L. E. Olshteyn. Sep 68, 14p NASA-TT-F-11583
Contract NASW-1694
Coll- 14 P Refs Tran- Transl. Into English From the Publ. "Iopatochnyye Mashiny I Struynyye Apparaty" Moscow, Mashinostr. Press, 1967 P 134-146

Descriptors: *Separated flow, *Turbocompressors, Axial flow, Compressor efficiency, Flow geometry, Inlet flow, Pressure distribution, Pressure reduction.

For abstract, see STAR 06 12.
N68-22251 HC$3.00 MF$0.65

THE GEOMETRIC PROPERTIES OF AN EXPANDABLE WHIRLING-MEMBRANE SOLAR-ENERGY CONCENTRATOR.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A. R. Heath, Jr., and J. M. Jerke. May 68, 36p NASA-TN-D-4532
Contract 120-33-06-03-23

Descriptors: *Auxiliary power sources, *Expandable structures, *Solar collectors, *Spacecraft power supplies, Electric generators, Energy conversion, Metal coatings, Plastics, Solar radiation.

For abstract, see STAR 06 12.
N68-22258 HC$3.00 MF$0.65

SINGLE-STAGE EXPERIMENTAL EVALUATION OF BOUNDARY LAYER BLOWING TECHNIQUES FOR HIGH LIFT STATOR BLADES. I - COMPRESSOR DESIGN.
General Motors Corp., Indianapolis, Ind. Allison Div.
D. C. Chapman, and M. L. Miller. Feb 68, 104p NASA-CR-54564, EDR-5636, V. 1
Contract NAS3-7619

Descriptors: *Blowing, *Boundary layer control, *Stator blades, *Turbocompressors, Boundary layer separation, Inlet flow, Loads (forces), Pressure distribution, Test facilities.

For abstract, see STAR 06 12.
N68-22579 HC$3.00 MF$0.65

DEVELOPMENT OF AN IMPROVED OXYGEN ELECTRODE FOR USE IN ALKALINE H2 O2 FUEL CELLS QUARTERLY REPORT, JAN. 1 - MAR. 31, 1968.
Bureau of Mines, Pittsburgh, Pa. Pittsburgh Coal Research Center.
31 Mar 68, 8p NASA-CR-94352, Q-7
NASA ORDER W-12300

Descriptors: *Alkaline batteries, *Fuel cells, *Interstitials, Electrochemistry, Electrodes, Hydrogen, Metal compounds, Oxygen, Reduction (chemistry), Tables (data).

For abstract, see STAR 06 12.
N68-22706 HC$3.00 MF$0.65

BLADE DESIGN OF FRANCIS TURBINES FOR ENSURING HIGH ANTICAVITATION PROPERTIES (PROFILIROVANIE LOPASTI RADIALNO-OSEVOI GIDROTURBINY IZ USLOVIYA OBESPECHENIYA VYSOKIKH ANTIKAVITATSIONNYKH KACHESTV),
National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.
L. S. Shmuglyakov, and V. E. Lasenko. 1968, 15p SFCSI-Int (TT-67-59003)
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Energetika (USSR) n11 p100-6 1964.

Descriptors: (*Turbines, *Cavitation), (*Turbine blades, Design), Pressure, Distribution, Thickness, Mathematical analysis.
Identifiers: Francis turbine, Pressure distribution.

The main advantage of the method of blade profile design is that it gives a well defined solution of the problem considered -- it ensures uniform distribution of pressure on the rear side of the profile of finite thickness and consequently the design ensures high anticavitation characteristics for the blades. Moreover, the method of construction is by itself simple and the computations for the design can be made easily. (Author)
TT-67-59003 HC$3.00 MF$0.65

10B. Power Sources

THE METHOD OF OPTIMIZATION OF THE DEVELOPMENT OF POWER SYSTEMS WITH THE USE OF MATHEMATICAL MODELS (O METODE OPTIMIZATSII RAZVITIYA ENERGETICHESKIKH SISTEM S ISPOLZOVANIEM MATEMATICHESKIKH MODELEI),
Foreign Technology Div Wright-Patterson AFB Ohio
L. A. Melentev, and Yu. P. Syrov. 9 Jun 67, 33p Rept no. FTD-MT-67-48
Trans. of Akademiya Nauk SSSR. Izvestiya. Energetika i Transport, n5 p531-42 1964.

Descriptors: (*Electric power production, Mathematical models), Systems engineering, Optimization, Dynamic programming, Automation, Algorithms, USSR.
Identifiers: Translations.

The article describes a mathematical model for optimalizing the structure of a power system. The authors use the competition method, based on the principles of dynamic programming, and the relaxation method. The Siberian Power Institute has accumulated some experience in constructing and putting to use the so-called simplified linear and non-linear models of power systems; so far, this experience indicates that mathematical modeling is unquestionably superior to conventional manual computing methods, which imply that the system remains static. Even the use of simplified models offers great in choosing optimal developmental strategy, delineating the relative importance of various factors in the solution, and determining the relative economy of the various possible structures of a system; modeling also makes it possible to assess directly the 'weight' of individual power plants in the effectiveness of an entire system. However, the models developed so far leave out of account a number of important factors, such as order of construction, optimal capacity of newly built stations, structural parameters, and the like. The article includes a brief discussion of models, the description of an optimalization algorithm, and graphic material.
AD-669 517 HC$3.00 MF$0.65

ISOTOPIC THERMOIONIC GENERATOR.
Generateur Thermoionique Isotopique
Commissariat A L Energie Atomique, Saclay (France).
M. Clemot, B. Devin, and J.-P. Durand. Dec 67, 26p CEA-R-3418
Lang- in French

Descriptors: *Spacecraft power supplies, *Thermionic converters, *Thermionic power generation, Curium 244, Plutonium 238, Thermionic emitters, Thermoelectric generators.

For abstract, see STAR 06 12.
N68-22701 HC$3.00 MF$0.65

TEST EVALUATION OF FUEL CELL CATALYSTS FINAL REPORT.
Catalyst Research Corp., Baltimore, Md.
H. J. Goldsmith, J. R. Moser, and T. Webb. 15 Feb 68, 16p NASA-CR-94403
Contract NASW-1577

Descriptors: *Bromides, *Carbides, *Catalysts, *Electrolytes, *Surface reactions, Alloys, Ammonia, Carbon monoxide, Electrodes, Oxidation, Platinum, Tafel law.

For abstract, see STAR 06 12.
N68-22752 HC$3.00 MF$0.65

FUEL CELL RELIABILITY ASSESSMENT QUARTERLY REPORT, 8 JAN. - 8 APR. 1968.
Allis-Chalmers Mfg. Co., Milwaukee, Wis. Advanced Electrochemical Products Div.
R. P. Bruno. May 68, 18p NASA-CR-94426, NAS-8-2696-QPR-2004
Contract NAS8-2696

Descriptors: *Acceptability, *Durability, *Fuel cells, *Reliability, Electrolytes, High temperature tests.

For abstract, see STAR 06 12.
N68-22811 HC$3.00 MF$0.65

FEASIBILITY STUDY OF HIGH PERFORMANCE HYDROGEN-OXYGEN FUEL CELLS FINAL TECHNICAL REPORT.
Esso Research and Engineering Co., Linden, N. J. Government Research Lab.
C. E. Heath, M. Lieberman, and E. H. Okrent. Dec 67, 123p NASA-CR-94407, GR-1-HOF-67
Contract NAS7-529

Descriptors: *Beds (process engineering), *Hydrogen oxygen fuel cells, *Systems engineering, Cathodes, Chemical reactions, Electric current, Flux density, Power efficiency, Slurries, Systems analysis.

For abstract, see STAR 06 12.
N68-22889 HC$3.00 MF$0.65

SOLAR THERMIONIC GENERATOR DEVELOPMENT QUARTERLY REPORT, 1 DEC. 1967 - 29 FEB. 1968.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Thermo Electron Engineering Corp., Waltham, Mass.
Apr 68, 35p NASA-CR-94402, TE4055-145-68
Contracts NAS7-100, JPL-951263
Prep- Prepared for Jpl

Descriptors: *Performance tests, *Solar collectors, *Thermionic converters, *Thermodynamic properties, Dynamic structural analysis, Fabrication, Heat radiators, Pipes (tubes), Solar energy absorbers.

For abstract, see STAR 06 12.
N68-22991 HC$3.00 MF$0.65

10C. Energy Storage

FIBERCELL OVERHEAT HAZARD DETECTION SYSTEM.
Whittaker Corp San Diego Calif Narmco Research and Development Div
For primary bibliographic entry see Field 1D.
AD-669 382 HC$3.00 MF$0.65

SEPARATOR DEVELOPMENT FOR A HEAT STERILIZABLE BATTERY QUARTERLY SUMMARY PROGRESS REPORT NO. 5, 1 JAN. - 31 MAR. 1968.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Monsanto Research Corp., Everett, Mass.
E. A. Mc Elhill, J. C. Oconnell, and C. A. Olson.
31 Mar 68, 15p NASA-CR-94322, MRB6234Q5
Contracts NAS7-100, JPL-951524
Prep- Prepared for Jpl

Descriptors: *Copolymers, *Separators, *Silver zinc batteries, *Sterilization, Electrical properties, Polymeric films.

For abstract, see STAR 06 12.
N68-22211 HC$3.00 MF$0.65

ELECTRON RADIATION EFFECTS ON SILVER-ZINC CELLS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
C. F. Palandati. Apr 68, 13p NASA-TM-X-63170

Descriptors: *Cellophane, *Electron radiation, *Radiation effects, *Separators, *Silver zinc batteries, Explorer 32 satellite, Radiation belts, Voltampere characteristics.

For abstract, see STAR 06 12.
N68-22226 HC$3.00 MF$0.65

HEAT STERILIZABLE NI- CD BATTERY DEVELOPMENT QUARTERLY PROGRESS REPORT, 1 OCT. - 31 DEC. 1967.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
P. V. Popat, and E. J. Rubin. 31 Dec 67, 55p NASA-CR-94315, QPR-2
Contracts NAS7-100, JPL-951972
Prep- Prepared for Jpl

Descriptors: *Microscopy, *Nickel cadmium batteries, *Porosity, *X ray diffraction, Corrosion, Crystallography, Electrochemistry, Fabrication, Morphology, Sterilization, Temperature effects.

For abstract, see STAR 06 12.
N68-22235 HC$3.00

OVERCHARGE CONTROL OF NICKEL-CADMIUM SPACECRAFT BATTERIES USING THE AUXILIARY ELECTRODE SIGNAL.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
F. E. Ford. Mar 68, 31p NASA-TM-X-63177, X-716-68-121

Descriptors: *Electrochemistry, *Nickel cadmium batteries, *Spacecraft power supplies, Dry cells, Electric equipment tests, Oao, Optimization, Overvoltage, Performance tests, Temperature distribution, Voltage regulators.

For abstract, see STAR 06 12.
N68-22377 HC$3.00 MF$0.65

THE REACTIONS PERTAINING TO ZINC-SILVER AND CADMIUM-SILVER BATTERIES QUARTERLY REPORT, PERIOD ENDING 15 MAR. 1968.
Idaho State Univ., Pocatello. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Dept. of Chemistry.
G. M. Arcand. 15 Mar 68, 19p NASA-CR-94382, QR-4
Contracts NAS7-100, JPL-951887
Prep- Prepared for Jpl

Descriptors: *Electrochemical oxidation, *Silver cadmium batteries, *Silver zinc batteries, *Thermal degradation, Cell anodes, Cell cathodes, Deposition, Electrolytes.

For abstract, see STAR 06 12.
N68-22565 HC$3.00 MF$0.65

SEPARATOR DEVELOPMENT PHASE OF HEAT- STERILIZABLE BATTERY DEVELOPMENT PROGRAM - BATTERY CASE DEVELOPMENT FINAL REPORT, 10 APR. 1967 - 31 JAN. 1968.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Whittaker Corp., San Diego, Calif. Narmco Research and Development Div.
15 Feb 68, 14p NASA-CR-94353
Contracts NAS7-100, JPL-951091
Prep- Prepared for Jpl

Descriptors: *Materials tests, *Polymer chemistry, *Storage batteries, Acceptability, Adhesives, Epoxy resins, Evaluation, Polymers, Sterilization, Tensile strength.

For abstract, see STAR 06 12.
N68-22707 HC$3.00 MF$0.65

THE REACTIONS PERTAINING TO ZINC-SILVER AND CADMIUM-SILVER BATTERIES.
Idaho State Univ., Pocatello. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Dept. of Chemistry.
G. M. Arcand. 15 Sep 67, 20p NASA-CR-94393, QR-2
Contracts NAS7-100, JPL-951887
Prep- Prepared for Jpl

Descriptors: *Electrochemical oxidation, *Silver zinc batteries, *Thermogravimetry, Electrodes, Potassium hydroxides, Silver cadmium batteries, Solutions.

For abstract, see STAR 06 12.
N68-22890 HC$3.00 MF$0.65

HEAT STERILIZABLE, IMPACT RESISTANT CELL DEVELOPMENT QUARTERLY REPORT, 1 OCT. - 31 DEC. 1967.
Electric Storage Battery Co., Yardley, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Carl F. Norberg Research Center.
G. W. Bodamer. 14 Mar 68, 66p NASA-CR-94404, QR-4
Contracts NAS7-100, JPL-951296
Prep- Prepared for Jpl

Descriptors: *Electrochemical cells, *Impact tolerances, *Shock resistance, *Sterilization, *Storage batteries, Capacitance, High current, Product development, Systems engineering, Thermal resistance.

For abstract, see STAR 06 12.
N68-22908 HC$3.00 MF$0.65

11. MATERIALS

11B. Ceramics, Refractories, and Glasses

A CENTER OF COMPETENCE IN SOLID STATE MATERIALS AND DEVICES.
Florida Univ Gainesville Coll of Engineering
For primary bibliographic entry see Field 20L.
AD-669 580 HC$3.00 MF$0.65

MATERIALS FOR HIGH-TEMPERATURE METAL-MELTING CONTAINERS.
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
Wendell P. Meier. 21 Feb 68, 11p*
Contract AT (29-1)-1106

Descriptors: (*Refractory materials, *Containers), Powder metallurgy, Melting, Sintering, Tungsten compounds, Zirconium compounds, Borides, Oxides, Nitrides, Carbides.

For abstract, see NSA 22 10.
RFP-900 HC$3.00 MF$0.65

11C. Coatings, Colorants, and Finishes

RODENT RESISTANT CABLE MATERIALS.
Army Natick Labs Mass Applied Entomology Group
For primary bibliographic entry see Field 17B.
AD-669 234 HC$3.00 MF$0.65

COATING SELECTION PROGRAM - THEORY.
General Electric Co., Philadelphia, Pa.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 06 12.
N68-22391 HC$3.00 MF$0.65

DEVELOPMENT OF A RAPID DRYING TRAFFIC PAINT SYSTEM USING MICRO-WAVE ENERGY.
Final rept.
Litton Industries, Palo Alto, Calif. Atherton Div.
17 Nov 66, 67p*
Contract MR-137
Prepared in cooperation with California State Div. of Highways, and Bureau of Public Roads, Washington, D. C.

Descriptors: (*Paints, Trafficability), Drying, Driers (Apparatus), Scientific research, Microwave equipment, Radiofrequency power, Dielectric properties, Test equipment (Electronics), Test methods, Acceptability, Degradation.

This report describes the results of a research contract awarded an electronics company to develop a suitable traffic paint and to design equipment which would dry the traffic paint to a state of 'no pick-up' in approximately one second by the application of micro-wave energy. After several months of investigation the contracting company concluded it was not technically feasible to achieve the objectives with the contract because of the difficulty in generating a sufficiently high energy intensity at the dielectric interface of the paint and pavement surfaces. (BPR Abstract)
PB-177 881 HC$3.00 MF$0.65

SOLAR HEATING OF VARIOUS SURFACES.
National Bureau of Standards, Washington, D. C.
For primary bibliographic entry see Field 20M.
PB-177 986 HC$3.00 MF$0.65

11D. Composite Materials

AIR CRAFT LANDING GEAR BRAKE FRICTION MATERIALS DEVELOPMENT.
Armour Research Foundation Chicago Ill
For primary bibliographic entry see Field 1C.
AD-669 388 HC$3.00 MF$0.65

VARIABLES AFFECTING STRENGTH AND MODULUS OF SHORT FIBER COMPOSITES,
Monsanto Research Corp St Louis Mo
R. M. Anderson, and R. E. Lavengood. 1968, 9p Rept no. HPC-67-32
Contract N00014-67-C-0218, ARPA Order-873
Report on Monsanto/Washington Univ. Association project Development of High Performance Composites.
Availability: Published in SPE Journal v24 n3 p20-6 Mar 1968.

Descriptors: (*Composite materials, Mechanical properties), Fibers, Boron, Glass textiles, Reinforcing materials, Reinforced plastics, Epoxy plastics, Flexural strength, Efficiency, Modulus of elasticity, Whiskers (Crystals), Filaments, Metallic crystals.

Matrix modulus, fiber aspect ratio and the ratio of fiber modulus to matrix modulus were all found to be important parameters in determining the efficiency of the reinforcing fibers. Comparable effects on fiber efficiency are obtained by changes in matrix modulus independent of whether variations in matrix modulus are achieved by chemical modification of the matrix or by changing the test temperature. Within the range of E sub m and fiber length investigated, the efficiency with which fibers are utilized for reinforcement is proportional to the logarithm of matrix modulus. Fiber utilization efficiency is proportional to the logarithm of E sub f/E sub m for both the glass and the boron reinforced composites. Thus it appears that E sub f/E sub m is a more pertinent parameter than the matrix modulus for determining fiber efficiency. (Author)
AD-669 475 Not available from CFSTI.

FRACTOGRAPHY OF COMPOSITE MATERIALS,
Monsanto Research Corp St Louis Mo
John D. Fairing. 1968, 9p Rept no. HPC-68-58
Contract N00014-67-C-0218, ARPA Order-873
Report on Monsanto/Washington Univ., ARPA Association project Development of High Performance Composites.
Availability: Published in Scanning Electron Microscopy, 9p 1968.

Descriptors: (*Composite materials, *Fractography), (*Electron microscopy, Composite materials), Failure (Mechanics), Interfaces, Reinforcing materials, Microstructure.
Identifiers: *Scanning electron microscopy.

The fractographic examination of composite materials with the scanning electron microscope provides essential information in the study of failure mechanisms. There are present specific features on the fracture surface which can be correlated with the physical properties of composites. In particular, the effects of reinforcement surface treatments on interfacial failures can be determined. (Author)
AD-669 476 Not available from CFSTI.

STATIC TESTS OF REINFORCED CONCRETE BEAMS. REPORT 1. DEVELOPMENT OF ITERATIVE ANALYSIS PROCEDURE AND TESTS OF BEAMS REINFORCED WITH STEEL ALUMINUM, AND FIBER GLASS, WITH AND WITHOUT HELICAL COMPRESSIVE REINFORCEMENT.
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 13M.
AD-669 609 HC$3.00 MF$0.65

INVESTIGATION OF BONDING IN OXIDE-FIBER (WHISKER) REINFORCED METALS.
Progress rept. no. 5, 18 Apr 67-18 Apr 68,
General Electric Co Philadelphia Pa Missile and Space Div
M. J. Noone, and W. H. Sutton. 18 Apr 68, 53p
AMMRC-CR-66-01/7
Contract DA-19-066-AMC-0330 (X)

Descriptors: (*Composite materials, *Bonding), (*Nickel alloys, Composite materials), (*Whiskers (Crystals), Composite materials), Sapphires, Interfaces, Reinforcing materials, Wetting, Coatings, Ceramic fibers, Tungsten, Hafnium compounds, Titanium compounds, Carbides.
Identifiers: *Metal-matrix composites.

In a continued study of the effects of wetting, bonding and interfacial reactions in the system Ni-alloy/Al2O3 (sapphire), the emphasis was placed on the influence of interfacial reactions on the strength of the underlying sapphire. This aspect is of prime importance in the development of high-strength reinforced composites with nickel matrices. High-strength flame-polished sapphire rods were prepared and used to assess quantitatively the effects of surface interactions with Ni-alloys on the strength of sapphire. Severe surface degradation was observed and resulted in relatively low measured strength; similar effects were also observed qualitatively on sapphire whiskers. The need for a protective coating to preserve the surface (and hence the strength) of sapphire filaments was thus indicated. Some studies of possible 'barrier' coatings for use in this application were initiated. Preliminary work was conducted on W, HfC and TiC coatings. (Author)
AD-669 654 HC$3.00 MF$0.65

THE EFFECT OF INTERFIBER DISTANCE AND TEMPERATURE ON THE CRITICAL ASPECT RATIO IN COMPOSITES.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. W. Jech, and R. A. Signorelli. May 68, 26p
NASA-TN-D-4548
Contract 129-03-09-01-22

Descriptors: *Composite materials, *Reinforcing fibers, *Temperature effects, Deformation, Fiber strength, Shear strength, Tensile strength, Wire.

For abstract, see STAR 06 12.
N68-22338 HC$3.00 MF$0.65

11E. Fibers and Textiles

A GENERAL COMPUTER PROGRAM FOR EVALUATION OF TEMPERATURE PROFILES AND INTERFACE POSITION IN FILAMENTS UNDERGOING SOLIDIFICATION.
Final rept.,
Aerospace Research Labs Wright-Patterson AFB Ohio
Milton E. Morrison. 1968, 51p* Rept no. ARL-68-0064

Descriptors: (*Fibers (Synthetic), Spinning), (*Spinning, *Computer programs), Filaments, Cooling, Temperature, Interfaces, Numerical analysis, Polymers, Heat transfer, Phase studies, Freezing.
Identifiers: Solidification, FORTRAN.

A computer program is described for numerical evaluation of temperature profiles and interface position as a function of time for cylindrical filaments undergoing solidification. The method is outlined for cooling and solidification of a moving filament of molten polymer; however, unsteady-state heat transfer in two-phase systems can be studied with the same program. Boundary conditions include the effect of convective and radiative energy losses. The program listing is given in FORTRAN IV. (Author)
AD-669 329 HC$3.00 MF$0.65

AIRCRAFT PENNANT INVESTIGATION,
Aeroplane and Armament Experimental Establishment Boscombe Down (England)
For primary bibliographic entry see Field 1C.
AD-669 675 HC$3.00 MF$0.65

STUDIES ON CARBONIZATION OF POLYACRYLONITRILE FIBRE. PART 6 - CHANGE IN MOLECULAR STRUCTURE DURING CARBONIZATION PROCESS.
Royal Aircraft Establishment, Farnborough (England).
O. Ishizuka, M. Katayama, K. Miyamichi, and M. Okamoto. Dec 67, 11p RAE-LIB-TRANS-1273
Tran- Transl. Into English From J. Soc. Fibre Sci. and Tech., Japan, V. 22, No. 12, 1966 P 548- 551

Descriptors: *Acrylonitriles, *Carbonization, *Molecular structure, *Structural analysis, *Synthetic fibers, Electrical properties, Electron paramagnetic resonance, Fireproofing, Polymer chemistry, X ray diffraction.

For abstract, see STAR 06 12.
N68-22018 HC$3.00 MF$0.65

A STATE OF THE ARTS SURVEY AND A STUDY OF THE FEASIBILITY OF RESEARCH IN THE AREA OF NEEDLE HEATING DURING HIGH SPEED SEWING.
Final rept.,
North Carolina State Univ., Raleigh. Dept. of Textile Technology.
S. P. Hersh, and P. L. Grady. 15 Apr 68, 58p
Contract CST-420

Descriptors: (*Textiles, Manufacturing methods), (*Machines, *Thermodynamics), Thermal analysis, Thermocouples, State-of-the-art reviews, Cyclic rate, Cooling, Temperature, Economics, Velocity, Thermal stresses, Malfunctions, Penetration, Statistical analysis.
Identifiers: Sewing needles, High speed sewing.

A review of the literature and extensive interviews have been conducted on the subject of needle heating in high speed sewing. As a result of this study, a survey of the current state of the art and knowledge available in the field has been completed and is presented in the following categories: (1) the nature of the problem and the difficulties which arise in commercial operations; (2) quantitative methods of measuring needle temperatures; (3) the influence of machine factors such as sewing speed, length of sewing time, and needle design on the heat generated during sewing; (4) the influence of material factors such as fabric structure and finish, layers of fabric, and sewing thread on needle heating; (5) techniques for alleviating needle heating problems; and (6) the mechanism of heat generation and dissipation of the sewing process. From the results of the survey, it was concluded that the most fruitful area for additional research would be a study of needle-fabric interactions. Some exploratory results of such a study are presented along with suggested techniques for use in further studies. A second area of useful research would be to determine the economic loss resulting from needle heating problems. Such knowledge would help in assessing the potential economic gains to be achieved from investments in research on needle heating. (Author)
PB-178 195 HC$3.00 MF$0.65

11F. Metallurgy and Metallography

STRENGTHENING MECHANISMS IN DISPERSION HARDENED NICHROME,

Boeing Co Renton Wash Airplane Div
Donald Webster. 23 Jan 68, 46p Rept no. D6-19773

Descriptors: (*Nickel alloys, *Dispersion hardening), Hardening, Chromium alloys, Thorium compounds, Dioxides, Solid solutions, Dislocations, Grain size, Ductility, Tensile properties, Grain structures (Metallurgy), Fatigue (Mechanics), Stresses.
Identifiers: Nichrome TD (NiCr-2ThO2), Thoria.

The strengthening mechanisms in TD Nichrome was examined at temperatures between 70F and 2000F. A contribution to strength at all temperatures comes from solid solution hardening, dispersion hardening and dislocation substructure hardening. Grain size hardening is operative only below 800F; at higher temperatures a fine grain size results in a loss of strength. The contribution of dispersion hardening is almost constant up to 1000F and then drops sharply. Dislocation substructure strengthening becomes increasingly important as the testing temperature is increased and is the major strengthening factor at 2000F. (Author)
AD-669 208 HC$3.00 MF$0.65

MICRO VOIDS INFLUENCE METAL PROPERTIES,
Boeing Co Renton Wash Airplane Div
D. Webster. 23 Jan 68, 24p Rept no. D6-19772

Descriptors: (*Metallography, Bubbles), Nickel alloys, Chromium, Stainless steel, Dispersion hardening, Particles, Microstructure, Recrystallization, Austenite, Grain size, Deformation, Thorium compounds, Dioxides, Metals, Grain structures (Metallurgy).

Voids were found to form around hard particles during the deformation of both thoria dispersed nichrome (TDNiC) and a martensitic stainless steel, AFC 77. In the TDNiC the voids retard recrystallization and thereby increase high temperature strength. In AFC 77 the voids prevent austenite grain growth. (Author)
AD-669 212 HC$3.00 MF$0.65

CHEMICAL ISOLATION AND ANALYSIS OF METALLIC COMPOUNDS FORMED IN CERTAIN ALLOYS WITH NICKEL BASE,
General Dynamics/Astronautics San Diego Calif
For primary bibliographic entry see Field 7D.
AD-669 233 HC$3.00 MF$0.65

SOME EFFECTS OF POWDER PARTICLE SIZE ON THE PHYSICAL BEHAVIOR OF PRESS FORGED BERYLLIUM.
Technical rept.,
Army Materials and Mechanics Research Center Watertown Mass
Jacob Greenspan. May 68, 14p* Rept no. AMMRC-TR-68-08

Descriptors: (*Beryllium, *Powder metallurgy), Impurities, Oxides, Powder metals, Forging, Particle size, Hardness, Tensile properties, Fractography, Microstructure, Ductility, Impact shock, Shock resistance, Thermal analysis, Castings, Cracks.

Powder metallurgy beryllium generally contains an oxide dispersoid, due to particle surface scale, and thus the material actually is a system subject to particle strengthening. The present report shows a dependence of strength on raw powder particle size and also on thermal history. (Author)
AD-669 240 HC$3.00 MF$0.65

EVALUATION OF THE X-RAY DIFFRACTION METHOD FOR DETERMINING VOLUME PERCENT OF RETAINED AUSTENITE IN CARBON STEEL.
Technical rept.,
Army Weapons Command Rock Island Ill Research and Engineering Div
Richard J. Brincks. May 68, 20p
RIA-68-1105

Descriptors: (*Austenite, *X-ray diffraction analysis), Steel, Carbon alloys, Quantitative analysis, Martensite.

Selected austenite and martensite lines were scanned at 1 degree per minute using an X-ray Diffractometer. The trace of the reflections was recorded on a strip chart recorder. The area under each peak was calculated and the volume percent retained austenite determined for each of five samples. It is indicated that the surface preparation of the sample analyzed has no effect on the results of the analysis. The reproducibility in this procedure was found to vary between plus or minus 3% and plus or minus 5% depending on the method of calculation. (Author)
AD-669 243 HC$3.00 MF$0.65

RELATIONSHIP BETWEEN SEGREGATION SUBSTRUCTURES AND CASTING STRUCTURES.
Technical rept.,
Comision Nacional de Energia Atomica Buenos Aires (Argentina) Departamento de Metalurgia
H. Biloni, M. A. Audero, R. Morando, F. J. Kiss, and R. DiBella. Mar 68, 78p Rept no. TR-2
Grants DA-ARO-49-092-66-G105, DAHC19-68-G-0014
See also AD-652 288.

Descriptors: (*Crystal substructure, Castings), (*Castings, Freezing), Zinc alloys, Cadmium alloys, Crystal growth, Porosity, Supercooling, Grain structures (Metallurgy), Aluminum alloys, Copper alloys, Microstructure, Grain boundaries, Magnetic fields, Thermal analysis.

Contents: (1) Cellular solidification in HCP alloys of Zn-Cd grown unidirectionally. Node mechanism in substructure evolution and morphological features of dendritic stages emphasized. (2) Predentritic solidification, especial attention to columnar and equiaxed grains in Al-Cu alloys and Sn-Zn alloys. Also tridimensional model analysis used. (3) Studies of surface and subsurface structure of Al-Cu alloys, effects of mold, mold surface treatment (lamp black, graphite, copper). High heat extraction condition - copious nucleation is responsible for chill zone. Low heat extraction - coarse grain structure with dendritic morphology, size relates to convection. (4) Scale-up-of-ingot-size effects and magnetic field effects - in large sizes (500 - 5000 cc) poured in magnetic field coarse equiaxed region persists at center. Probable mechanism Winegard Chalmers. (5) Segregation substructures: origin and nature of chill zone; stability of crystal growing freely in bulk liquid; picture and degree of segregation in columnar region as function of alloy crystallography; grain boundary migration during cooling after solidification completed. (Author)
AD-669 250 HC$3.00 MF$0.65

A FIELD-EMISSION MICROSCOPE INVESTIGATION OF THE EFFECTS OF AMBIENT ATMOSPHERES ON THE STRESS-CORROSION CRACKING OF URANIUM-MOLYBDENUM ALLOYS.
Final rept.;
Arizona Univ Tucson Dept of Electrical Engineering
S. A. Hoenig, and Herman Sulsona. Mar 68, 128p
Contract DA-18-001-AMC-1063 (X)

Descriptors: (*Uranium alloys, Stress corrosion), (*Molybdenum alloys, Stress corrosion), (*Stress corrosion, *Reactor fuels), Heat treatment, Cracks, Microscopes, Field emission, Water vapor, Fracture (Mechanics), Shielding, Loading (Mechanics), Electric fields, Nitrogen, Fracture (Mechanics), Cathodic protection, Gases, Grain structures (Metallurgy), Environmental tests, Hydrogen embrittlement.
Identifiers: Uranium alloy, 10Mo, Field-ion microscopy.

The effects of heat treatment and ambient atmospheres on the stress-corrosion cracking behavior of U-10 w/o Mo were investigated using a field-emission microscope of cylindrical geometry. Cathodic protection and the effect of static electric DC fields were investigated as possible protective techniques in the stress-corrosion cracking of U-10 w/o Mo. A special 'gas shield' protective technique was also investigated. The stress-corrosion cracking behavior of U-10 w/o Mo was found to be influenced by heat treatments. A gamma homogenization and quench followed by a tempering treatment were found to be most beneficial in reducing the susceptibility of the alloy. A tentative 'critical stress' for initiation of stress-corrosion cracking was set at 36,500 psi. This critical stress was found to be strongly dependent upon heat treatments and internal structure. Cathodic protection and electric fields had no effect on the stress-corrosion cracking behavior of U-10 w/o Mo. Pure, dry nitrogen on the other hand, was found to be most effective as a protective shield during cyclic loading of U-10 w/o Mo specimens. (Author)
AD-669 252 HC$3.00 MF$0.65

ENVIRONMENTAL CRACKING IN AISI 4340 STEEL.
Final rept.,
Illinois Univ Urbana Dept of Theoretical and Applied Mechanics
W. A. Van Der Sluys. Feb 68, 20p* Rept no. T/AM-312
AROD-5612:3-MC
Grant DA-ARO (D)-31-124-G872

Descriptors: (*Steel, Fracture (Mechanics)), (*Stress corrosion, Steel), Cracks, Crack propagation, Fatigue (Mechanics), Heat of activation, Cantilever beams, Test methods.
Identifiers: Steel 4340.

Knowledge of the subcritical flaw growth characteristics of the material under the expected service conditions is an important part of any fracture control plan. The prime causes of subcritical flaw growth are fatigue, adverse environment, or both. Fatigue loading will cause crack growth in all metals while adverse environments may or may not. In some steels a moist air environment is of severe enough nature to cause substantial subcritical flaw growth. For the materials engineer working in the area of fracture control, all flaw growth due to environment has become known as stress corrosion cracking although the mechanism in many cases is probably not one of corrosion. Therefore, in this paper the term environmental cracking will be used when referring to cracking caused by adverse environments. (Author)
AD-669 255 HC$3.00 MF$0.65

STRESS CORROSION CRACKING IN AIRCRAFT STRUCTURAL MATERIALS.
Conference proceedings.
Advisory Group for Aerospace Research and Development Paris (France)
1967, 248p* Rept no. AGARD-CP-18
NATO Furnished. Presented at the Symposium held by the Structures and Materials Panel of AGARD, Turin, Italy, 18-9 Apr 67.

Descriptors: (*Stress corrosion, Symposia), (*Aluminum alloys, Stress corrosion), (*Steel, Stress corrosion), (*Titanium alloys, Stress corrosion), Theory, Martensite, Stainless steel, Maraging steels, Reviews, Structural parts, Airframes.

Contents: General theory of stress corrosion; Laboratory aspects of aluminium alloys; Some engineering aspects of stress corrosion cracking in high strength aluminium alloys; Engineering aspects of stress corrosion failure in martensitic steels; Stress corrosion cracking of high strength

stainless steels; Stress corrosion of titanium alloys; Stress corrosion cracking of very strong low alloy and maraging steels: laboratory aspects; National surveys of work on stress corrosion cracking.
AD-669 282 HC$3.00 MF$0.65

CURRENT PAUSE DURING ELECTRIC EXPLOSION OF LITTLE WIRES IN THE AIR (TOKOVAYA PAUZA PRI ELEKTRICHESKOM VZRYVE PROVOLOCHEK V VOZDUKHE),
Foreign Technology Div Wright-Patterson AFB Ohio
K. I. Dolmatov, A. N. Tazitdinov, and Yu. I. Timokhina. 31 Oct 67, 9p Rept no. FTD-HT-23-827-67
Unedited rough draft trans. of Akademiya Nauk Uzbekskoi SSR, Tashkent. Izvestiya. Seriya Fiziko-Matematicheskikh Nauk, n5 p86-9 1966, by L. Marokus.

Descriptors: (*Wire, Electric currents), Electric discharges, Electrical properties, Capacitors, Resistance (Electrical), Metals, Tungsten, Iron, Molybdenum, Tantalum, Circuit, Oscillographs, Potentiometers, Voltage, Test methods, USSR.
Identifiers: Current pauses, Translations.

A study of the nature of the interruption of current during the electrical explosion of fine wires in air is described. The interruption of current is the time interval between the end of the first and the beginning of the second current pulse flowing through the fine wire. An RLC circuit (R = 0.02 omega; L = 0.4 mu h; C = 300 mu h (consisting of two IM-5-15 capacitors connected in parallel) was used to send current through the fine wire. The capacitor was charged to 3.1 kv at the beginning of each test. An oscillograph was connected to the movable arm of a potentiometer connected across the wire sample. Samples of W, Mo, Ta, and Fe wires with lengths ranging from 5 to 150 mm and diameters from 0.05 to 0.30 mm were used in the tests. Test results for 50-mm long W, Mo, Ta, and Fe wires with diameters of 0.30, 0.14, and 0.24 mm are shown in Fig. 1. The duration of the interruption of current for wires made from above metals is more stable than that for copper wires. The interruption duration is a function of the wire length and diameter; it increases sharply with wire length. At high initial voltages across the capacitor current pauses are very short and it is difficult to establish their dependence on the wire diameter. Current interruption duration decreases with increasing initial voltage across the capacitor. Orig. art. has: 3 figures and 1 table. (Author)
AD-669 299 HC$3.00 MF$0.65

THE REFRACTORY METALS-AN EVALUATION OF AVAILABILITY,
Battelle Memorial Inst Columbus Ohio Defense Metals Information Center
F. H. Buttner, and R. W. Hale. Mar 68, 15p Rept no. DMIC-Memo-235
Contract F33615-68-C-1325

Descriptors: (*Refractory metals, Abundance), Niobium, Tantalum, Molybdenum, Tungsten, Rhenium, Consumption, Industrial procurement, Costs, Industrial production, Natural resources, Industries, Metals, Transition elements.

The memorandum discusses the supply, production, consumption, and applications of the refractory metals, columbium, tantalum, molybdenum, tungsten, and rhenium. Lists of manufacturers of mill products of these metals are included. (Author)
AD-669 371 HC$3.00 MF$0.65

ARPA COUPLING PROGRAM ON STRESS-CORROSION CRACKING.
Quarterly rept. no. 5, 1 Jan-30 Apr 67,
Naval Research Lab Washington D C
E. P. Dahlberg. Feb 68, 34p NRL-MR-1864
ARPA Order-878
See also AD-663 560.

Descriptors: (*Stress corrosion, Reviews), Titanium alloys, Aluminum alloys, Fracture (Mechanics), Electrochemistry, Steel, Microstructure, Surface properties, Heat-resistant metals + alloys, Flexural strength, Electron microscopy, Crack propagation, Tensile properties, Polarization, Impurities.
Identifiers: Aluminum alloy 7075-T6, Titanium alloy 6Al 4V, Titanium alloy 8Al 1Mo 1V, Titanium alloy 4Al 3Mo 1V, Titanium alloy 5Al 2.5Sn, Titanium alloy 3Al 11Cr 13V.

A progress report of the research investigations being carried out on the problem of stress-corrosion cracking of high strength materials is presented. Work concerning physical metallurgy, surface chemistry, fracture mechanics, and characterization tests and translation related to stress-corrosion cracking is described. The materials being studied include high strength steels, titanium alloys, and aluminum alloys. Abstracts of recently published reports and a diary of events are included. (Author)
AD-669 487 HC$3.00 MF$0.65

CRACK EXTENSION BY ALTERNATING SHEAR,
Boeing Scientific Research Labs Seattle Wash Solid State Physics Lab
F. A. McClintock, and R. M. N. Pelloux. Feb 68, 32p Rept no. D1-82-0708
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge. Materials Div.

Descriptors: (*Crack propagation, Alloys), (*Fracture (Mechanics), Alloys), Surface properties, Shear stresses, Ductility, Rupture, Fatigue (Mechanics), Aluminum alloys, Titanium alloys, Steel, Copper.
Identifiers: 2024 T3 aluminum alloy, 6061 aluminum alloy, 4340 steel.

A comparison of the slip line flow field at the tip of a sharp crack and of a blunted crack shows that a sharp crack can be extended by alternating shear until it becomes blunted. Crack tip blunting is associated with high strain concentration and fracture by hole growth and coalescence. Crack extension by alternating shear has been obtained in fully plastic, plane strain sharply notched, singly and doubly grooved tensile specimens. Electron fractography shows crack extension by alternating shear at the tip of cleavage and fatigue cracks. It is shown that fatigue crack propagation is the result of repeated cyclic crack extension by alternating shear. (Author)
AD-669 531 HC$3.00 MF$0.65

INVESTIGATION OF PRECURSOR DECAY IN IRON BY THE ARTIFICIAL VISCOSITY METHOD,
Washington State Univ Pullman Dept of Physics
For primary bibliographic entry see Field 20K.
AD-669 536 Not available from CFSTI.

PROPERTIES AND APPLICATIONS OF DISPERSION-STRENGTHENED METALS.
Army Materials Research Agency Watertown Mass
For primary bibliographic entry see Field 13H.
AD-669 615 HC$3.00 MF$0.65

TRANSFORMATION PLASTICITY OF COBALT-NICKEL SINGLE CRYSTALS,
Illinois Univ Urbana Dept of Mining Metallurgy and Petroleum Engineering
For primary bibliographic entry see Field 20B.
AD-669 629 HC$3.00 MF$0.65

A REVIEW OF SPECIAL TECHNIQUES FOR MEASURING PLASTIC STRAIN.
Stanford Univ Calif Dept of Materials Science
For primary bibliographic entry see Field 20K.
AD-669 633 HC$3.00 MF$0.65

ADVANCES IN FRACTURE TOUGHNESS CHARACTERIZATION PROCEDURES AND IN QUANTITATIVE INTERPRETATIONS TO FRACTURE-SAFE DESIGN FOR STRUCTURAL STEELS.
Special summary and interpretative rept.,
Naval Research Lab Washington D C
William S. Pellini. 3 Apr 68, 88p Rept no. NRL-6713

Descriptors: (*Steel, Fracture (Mechanics)), (*Structural parts, Design), Test methods, Impact tests, Toughness, Drop testing, Theory, Ductility, Temperature, Flexural strength, Cracks, Defects (Materials), Strain (Mechanics), Failure (Mechanics), Stresses, Diagrams, Tables, Analysis.

The state of knowledge of fracture-safe design for steels is examined in relation to the requirements for achieving practical solutions to general engineering problems. Analytical procedures evolved from fracture mechanics theory are demonstrated to provide for quantitative interpretations of engineering fracture toughness tests. It is thus possible to couple the procedural simplicity which is inherent to engineering tests with the analytical advantages of fracture mechanics theory. The coupling of these two approaches provides for practical advances in fracture-safe design which cover the totality of general engineering problems and requirements. The Charpy V test is shown to have applicability for use in the described fashion primarily in relation to the strength transition for high strength steels. The combined diagrams should serve the needs of both the materials and design fields. (Author)
AD-669 690 HC$3.00 MF$0.65

DEVELOPMENT OF NON-DESTRUCTIVE METHODS FOR DETERMINING RESIDUAL STRESS AND FATIGUE DAMAGE IN METALS FINAL REPORT.
Benson (Robert W.) and Associates, Inc., Nashville, Tenn.
8 Mar 68, 157p NASA-CR-61584
Contract NAS8-20208

Descriptors: *Aluminum alloys, *Metal fatigue, *Shear stress, *Stress measurement, Nondestructive tests, Q factors, S waves, Shear properties, Surface waves, Ultrasonic wave transducers.

For abstract, see STAR 06 12.
N68-21875 HC$3.00 MF$0.65

CORRELATION OF FATIGUE CRACK PROPAGATION RATES WITH THE STRESS INTENSITY FACTOR IN AN ALUMINUM ALLOY (DTD 5070 A).
Royal Aircraft Establishment, Farnborough (England).
D. P. Rooke. Sep 67, 15p RAE-TR-67238

Descriptors: *Aluminum alloys, *Crack propagation, *Fatigue (materials), *Stress ratio, Correlation, Edge loading, Fatigue tests, Plastic flow, Rates (per time), Stress functions.

For abstract, see STAR 06 12.
N68-22192 HC$3.00 MF$0.65

CHEMICAL REACTIONS AT METAL SURFACES ANNUAL PROGRESS REPORT, MAY 1, 1967 - APR. 30, 1968.
Cornell Univ., Ithaca, N. Y. Applied Physics Dept.
L. H. Germer. 30 Apr 68, 7p NASA-CR-94332
Contract NGR-33-010-029

Descriptors: *Nickel, *Single crystals, *Surface properties, *Surface reactions, *Tungsten, *Work functions, Ammonia, Catalysis, Electron emission, Hydrogen, Metal surfaces, Oxygen, Reaction kinetics, Temperature effects.

For abstract, see STAR 06 12.
N68-22201 HC$3.00 MF$0.65

THE CORROSION RESISTANCE OF CERTAIN METALLIC MATERIALS FOR ASTRONOMICAL MIRRORS.
O Korroziynoy Ustoychivosti Hekotorykh Metallicheskikh Materialov Dlya Astronomicheskikh Zerkal
Tecnoy Ustoychivosti Hekotorykh Metallnoy Ustoychivosti Hekotorykh Metallsl. Into English From the Soobshch. Biurakanskoy Observ. (Yerevan), V. 38, 1967 P 58-65

Descriptors: *Aluminum alloys, *Corrosion resistance, *Magnesium alloys, *Mirrors, Astronomical telescopes, Chromium, Corrosion tests, Hydrochloric acid, Nickel, Protective coatings, Sodium chlorides.

For abstract, see STAR 06 12.
N68-22227 HC$3.00 MF$0.65

EFFECT OF COVER GAS PRESSURES UP TO 4 ATMOSPHERES ON ACCELERATED CAVITATION DAMAGE IN SODIUM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. R. Johnston, and S. G. Young. 1967, 39p NASA-TM-X-61065
Conf- Presented At Asme 1967 Winter Ann. Meeting, Pittsburg, 12-16 Nov. 1967

Descriptors: *Cavities, *Gas pressure, *Pressure effects, *Sodium, Metallography, Pitting, Test facilities, Vibration tests.

For abstract, see STAR 06 12.
N68-22341 HC$3.00

INVESTIGATION OF THE THERMAL STABILITY OF THE MICROSURFACE OF ASTRONOMICAL MIRRORS FABRICATED FROM A MG6 L ALLOY WITH CHROMIUM AND NICKEL COATINGS.
Issledovaniye Na Termostoikost' Mikropoverkhnosti Astronomicheskikh Zerkal Izgotovlennykh Iz Splava Amg6l S Khromovyn I Nikelevym Pokrytiyami
National Aeronautics and Space Administration, Washington, D. C.
ZH. M.Loresyan. Apr 68, 4p NASA-TT-F-11659
Tran- Transl. Into English From Soobshch. Byurakansk. Observ., Akad. Nauk Arm. Ssr (Erevan), No. 38, 1967 P 66-71

Descriptors: *Aluminum alloys, *Metal coatings, *Mirrors, *Solar collectors, *Surface properties, *Thermal stability, Chromium, Cracking (fracturing), Microstructure, Nickel, Temperature effects.

For abstract, see STAR 06 12.
N68-22401 HC$3.00 MF$0.65

STUDIES ON ATMOSPHERIC CORROSION OF STEELS RELATED TO METEOROLOGICAL FACTORS IN JAPAN. 2. MULTIPLE CORRELATION OF METEOROLOGICAL FACTORS AND ATMOSPHERIC POLLUTION SUBSTANCES ON CORROSION OF STEEL.
National Research Council of Canada, Ottawa (Ontario).
V. Hirai, K. Oma, and T. Sugano. 1967, 14p NRC-TT-1281
Tran- Transl. Into English From Corrosion Eng. (Japan), No. 14/1/, 1965 P 16-19

Descriptors: *Air pollution, *Corrosion, *Japan, *Steel structures, Atmospheric composition, Chemical attack, Combustion products, Industries, Meteorology, Statistical analysis.

For abstract, see STAR 06 12.
N68-22528 HC$3.00 MF$0.65

STUDY OF THE DIFFUSION OF SOME ELEMENTS IN MAGNESIUM.
L Etude de La Diffusion de Quelques Elements Dans le Magnesium
Commissariat A L Energie Atomique, Saclay (France).
K. Lal. 1967, 54p CEA-R-3136
Lang- in French

Descriptors: *Magnesium alloys, *Molecular diffusion, *Trace elements, Cerium, Indium, Lanthanum, Microanalysis, Silver, Volumetric analysis, Zinc.

For abstract, see STAR 06 12.
N68-22762 HC$3.00 MF$0.65

TEXTURE STRENGTHENING AND FRACTURE TOUGHNESS OF TITANIUM ALLOY SHEET AT ROOM AND CRYOGENIC TEMPERATURES.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
T. L. Sullivan. May 68, 32p NASA-TN-D-4444
Contract 124-08-08-19-22

Descriptors: *Fracture strength, *Low temperature tests, *Stress analysis, *Titanium alloys, Aluminum, Notch strength, Poisson ratio, Stress concentration, Weld strength.

For abstract, see STAR 06 12.
N68-22884 HC$3.00 MF$0.65

EFFECT OF HIGH HYDROSTATIC PRESSURES ON THE SELF-DIFFUSION OF GAMMA URANIUM AND THE NOBLE METALS.
Commissariat A L Energie Atomique, Saclay (France).
For primary bibliographic entry see Field 20J.
For abstract, see STAR 06 12.
N68-23002 HC$3.00 MF$0.65

GROUPS IV, V, AND VI TRANSITION METALS. SUPPLEMENT 1. SELECTED REFERENCES ON PREPARATION, STRUCTURE, PHYSICAL PROPERTIES, METALLOGRAPHY, AND TRANSPORT PROPERTIES.
Oak Ridge National Lab., Tenn.
1967, 27p*
Contract W-7405-eng-26

Descriptors: (*Transition elements, Bibliographies), (*Refractory metals, Bibliographies), Crystal structure, Crystal lattice defects, Metallography, Transport properties, Thermal properties, Mechanical properties, Magnetic properties.

For abstract, see NSA 22 10.
ORNL-RMIC-8-Suppl-1 HC$3.00 MF$0.65

11G. Miscellaneous Materials

EFFECT ON HEAT EXCHANGE AND FRICTION OF COOLANT SUPPLY IN TURBULENT BOUNDARY LAYER (VLIYANIE NA TEPLOOBMEN I TRENIE PODACHI OKHLADITELEI V TURBULENTNYI POGRANICHNII SLOI),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20M.
AD-669 527 HC$3.00 MF$0.65

SILICATE FOAM FOR AIRDROP CUSHIONING.
Southwest Research Inst San Antonio Tex
For primary bibliographic entry see Field 13D.
AD-669 666 HC$3.00 MF$0.65

BIBLIOGRAPHY OF MAGNETIC MATERIALS AND TABULATION OF MAGNETIC TRANSITION TEMPERATURES.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20C.
For abstract, see NSA 22 10.
ORNL-RMIC-7 HC$3.00 MF$0.65

THERMAL RESISTANCE OF AIRSPACES AND FIBROUS INSULATIONS BOUNDED BY REFLECTIVE SURFACES.
National Bureau of Standards, Washington, D. C.
For primary bibliographic entry see Field 20M.
PB-177 987 HC$3.00 MF$0.65

11H. Oils, Lubricants, and Hydraulic Fluids

NEOPENTYL POLYOL ESTERS FOR JET ENGINE LUBRICANTS-EFFECT OF TRICRESYL PHOSPHATE ON THERMAL STABILITY AND CORROSIVITY,
Naval Research Lab Washington D C
R. L. Cottington, and H. Ravner. 15 Feb 68, 21p* Rept no. NRL-6667

Descriptors: (*Airplane engine oils, Pyrolysis), (*Lubricant additives, *Organic phosphorus compounds), Alcohols, Esters, Thermal stability, Corrosion inhibition, Phosphates, Steel, Catalysis, Stabilization, Amines, Jet engines, Lubrication.
Identifiers: Tricresyl phosphates.

Chrome-alloy steel AMS-5504 and mild steel promote thermal decomposition of most neopentyl polyol ester base stocks and some Specification MIL-L-23699 lubricant formulations at 500F. Without metals, these esters are stable at this temperature. A few such polyol ester base stocks show a much lower sensitivity to steel at 500F; these exceptions are attributed to the effect of as yet unidentified components. Tricresyl phosphate (TCP) in 1 to 5 percent concentration effectively stabilizes metal-sensitive polyol esters by passivating the active metal surfaces. As in the case of the diester oils, the combination of TCP and water promotes ester hydrolysis and lead corrosivity; this hydrolytic degradation is inhibited by suitable aliphatic amines. (Author)
AD-669 432 HC$3.00 MF$0.65

A LABORATORY STUDY OF ANTICORROSIVE EFFECT OF LUBRICANT ADDITIVES (LABORATORNOE IZUCHENIE ANTIKORROZIINOGO DEISTVIYA PRISADOK K SMAZOCHNYM MASLAM),
Foreign Technology Div Wright-Patterson AFB Ohio
A. M. Kuliev, V. B. Liksha, and F. G. Suleimanova. 29 Aug 67, 8p Rept no. FTD-HT-23-902-67
Trans. of Azerbaidzhanskoe Neftyanoe Khozyaistvo (USSR) v43 n10 p38-40 1964, by F. Dion.

Descriptors: (*Lubricant additives, *Antioxidants), Oils, Lead, Corrosion inhibition, Phenols, Sulfonates, Fuel oil, Barium compounds, Zinc compounds, Phosphates, Esters, USSR.
Identifiers: Phosphorodithioates, Antiwear agents, Translations.

The anticorrosive action on Pb of alkylphenolic, sulfonated, and antioxidant additives used in various concentrations in Baku and Eastern U.S.S.R. oils was studied during oxidation of the oils at 150C for 25 hrs. The corrosion decreased with an increase of alkylphenol additive concentration. The sulfonated oil additive, SB-3 (Ba salt of sulfonic acids of sulfurized diesel oil), had an anticorrosive action for 15 hrs.; but, after 20-25 hrs., the corrosion was 10-12% higher than that in an oil without additive. The antioxidant additive, DF-11 (Zn dialkyl dithiophosphate) and the antiwear additive LZ-23K (ethylene diisopropylxanthate) in small amounts (0.5-1.2%) strongly decreased the corrosion. (Author)
AD-669 525 HC$3.00 MF$0.65

A REVIEW OF LUBRICATION OF SLIDING AND ROLLING ELEMENT ELECTRICAL CONTACTS IN VACUUM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. S. Przybyszewski. Apr 68, 33p NASA-TN-D-4476
Contract 129-03-13-02-22

Descriptors: *Electric contacts, *Metal films, *Thin films, *Vacuum effects, Deposition, Environmental tests, Friction, Lubrication, Materials tests, Wear tests.

For abstract, see STAR 06 12.
N68-21979 HC$3.00 MF$0.65

EFFECTS OF GAMMA RADIATION ON CERTAIN SYNTHETIC LUBRICANTS.
Effects des Rayonnements Gamma Sur Certains Lubrifiants Synthetiques
European Space Research Lab., Noordwijk (Netherlands).
J. Dauphin, and M. Ladous. Aug 67, 23p ESRO-TM-100
Coll- 23 P Refs Lang- in French, English Summary

Descriptors: *Fluorohydrocarbons, *Gamma rays, *Lubricants, *Radiation effects, *Silicone resins, Lubricating oils, Silicones, Viscosity.

For abstract, see STAR 06 12.
N68-22162 HC$3.00 MF$0.65

A CRITICAL EVALUATION OF THE STATUS AND TRENDS IN HIGH SPEED FLUID FILM LUBRICATION.
Case Inst. of Tech., Cleveland, Ohio.
E. S. Kulinski, and S. Ostrach. May 68, 25p
NASA-CR-1058
Contract NGR-36-003-004
Coll- 25 P Refs

Descriptors: *Fluid flow, *Journal bearings, *Lubrication, *Turbulent flow, Equations of motion, Films, High speed, Laminar flow, Newtonian fluids, Rotating cylinders, Vortices.

For abstract, see STAR 06 12.
N68-22810 HC$3.00 MF$0.65

11I. Plastics

FABRICATION TECHNIC FOR AN INFLATABLE NECK SPLINT.
Walter Reed Army Medical Center Washington D C Army Medical Biomechanical Research Lab
For primary bibliographic entry see Field 6L.
AD-669 237 HC$3.00 MF$0.65

MANUAL FOR PREPARATION OF A POROUS PTB SOCKET WITH SOFT DISTAL END.
Walter Reed Army Medical Center Washington D C Army Medical Biomechanical Research Lab
For primary bibliographic entry see Field 6E.
AD-669 238 HC$3.00 MF$0.65

THE TECHNOLOGY OF THERMOPLASTIC RECORDING OF IMAGES (TEKHNIKA TERMOPLASTICHESKOI ZAPISI IZOBRAZHENII),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 14E.
AD-669 420 HC$3.00 MF$0.65

MEDIUM STRAIN RATE, COMPRESSION TESTING OF SELECTED PLASTIC MATERIALS,
Naval Ordnance Lab White Oak Md
William M. Hinckley, and Frederick P. Stecher.
23 Dec 67, 105p* Rept no. NOLTR-67-178

Descriptors: (*Plastics, Compressive properties), Stresses, Strain (Mechanics), Shock absorbers, Rubber, Thermoplastics.

Stress-strain relations have been obtained in compression at medium strain rates for selected plastic materials suitable for shock mitigation. Data were acquired at room temperature, and at 200F and 350F for those materials capable of withstanding the elevated temperatures. Rates of strain between 0.004 in/in/sec and 60 in/in/sec were obtained using a conventional high-speed testing machine. Most of the materials investigated exhibited strain rate sensitivity over the range tested. (Author)
AD-669 447 HC$3.00 MF$0.65

NEW POLYMERIC MATERIALS IN ANTICORROSION TECHNOLOGY (NOVYE POLIMERNYE MATERIALY V ANTIKORROZIONNOI TEKHNIKE),
Foreign Technology Div Wright-Patterson AFB Ohio
I. Ya. Klinov. 18 Aug 67, 18p Rept no. FTD-HT-66-540
Unedited rough draft trans. of mono. Vsesoyuznoi Mezhvuzovskoi Nauchnoi Konferentsii po Voprosam Borby s Korroziei, Trudy. Moscow, 1962 p296-303, by L. Marokus.

Descriptors: (*Corrosion inhibition, *Plastics), Substitutes, Vinyl plastics, Graphite, Polymers, Chloroprenes, Halocarbon plastics, Silicone plastics, Glass textiles, Epoxy plastics, Nylon, USSR.
Identifiers: Translations.

The article enumerates several kinds of plastic materials which are suitable for use in combatting corrosion, and several which have suitable strength characteristics as to serve in place of scarce expensive metals and alloys. Included are vinyl for piping, sheet graphite for parts of heat exchangers, liquid 'Nairit' (chloroprene rubber) for anticorrosion protection of ship propellers. Plastics have also been used successfully to fabricate parts of armatures. Plastics of fluorocarbonic compounds have been found especially chemically stable, resisting ever fuming nitric acid and aqua regia. Polyorganosiloxanes have proven their value in preventing corrosion. Fiberglass has also found many uses in industrial plant installations. Epoxy resins, epoxy lacquers, nylon and other compounds are also described and examples given of their successful application. (Author)
AD-669 518 HC$3.00 MF$0.65

POLY (TRIS (DIALKYLPHOSPHINATO) ALANES); (NOVEL TRIS (PHOSPHINATES) OF ALUMINUM).
Dow Chemical Co Midland Mich
For primary bibliographic entry see Field 7B.
AD-669 644 Not available from CFSTI.

INVESTIGATION OF POLYMERIC COATINGS BY ELECTRODELESS DISCHARGE FINAL REPORT.
Commonwealth Scientific Corp., Alexandria, Va.
A. F. Pitas, and J. P. Redmond. 1968, 41p
NASA-CR-94310
Contract NASW-1625

Descriptors: *Electric discharges, *Hydrocarbons, *Polymeric films, Infrared spectra, Monomers, Plastic coatings, Polyethylenes, Vacuum deposition.

For abstract, see STAR 06 12.
N68-22039 HC$3.00 MF$0.65

POLYDIMETHYLSILOXANES MODIFIED BY THE INTRODUCTION OF DINEOPENTYLENE PHOSPHONATE GROUPS.
Royal Aircraft Establishment, Farnborough (England).
For primary bibliographic entry see Field 7C.
For abstract, see STAR 06 12.
N68-22650 HC$3.00

PROLONGED RESISTANCE OF FIBERGLASS REINFORCED PLASTICS UNDER BIAXIAL COMPRESSION BY A CONSTANT LOADING,
Lockheed Missiles and Space Co., Palo Alto, Calif.
F. P. Belyankin, V. F. Yatsenko, and G. G. Margolin. 1967, 3p
Trans. of Akademiya Nauk URSR, Kiev. Dopovidi. Seriya A: Fiziko-Tekhnichni i Matematiychni Nauky, n10 p925-7 1967.

Descriptors: (*Reinforced plastics, Compressive properties), Loading (Mechanics), Anisotropy, Compressive properties, Deformation, Elasticity, Fatigue (Mechanics), Statistical analysis, Glass textiles.
Identifiers: Translations.

A mathematical analysis, based on uniaxial compression equations, is presented for biaxial compression of plastic materials subject to a constant load.
PB-176 847T HC$3.00 MF$0.65

11J. Rubbers

SYNTHESIS AND PROPERTIES OF TETRAPOLYETHER ELASTOMERS,
Rock Island Arsenal Ill
Z. T. Ossefort, R. R. Freeman, and F. B. Testroet. 1968, 6p Rept no. RIA-68-1414
Availability: Published inI and EC Product Research and Development, v7 p17-21 Mar 1968.

Descriptors: (*Elastomers, *Ethers), Epoxy plastics, Synthesis (Chemistry), Catalysts, Metalorganic compounds, Aluminum compounds, Halohydrins, O-heterocyclic compounds, Polymerization, Vulcanizates, Additives, Carbon black, Physical properties.
Identifiers: *Polyethers.

Tetrapolyether elastomeric gums were prepared from various ratios of epichlorohydrin, ethylene oxide, propylene oxide, and allyl glycidyl ether in a solution polymerization using water-modified trialkyl aluminum catalysts. The high molecular weight gums were essentially linear and amorphous, as indicated by their solubility in acetone. Carbon black-reinforced vulcanizates were prepared from these gums using peroxide and sulfur cures. The low temperature properties were better than those of a commercial epichlorohydrin-ethylene oxide-based elastomer. However, this improvement was achieved only through some sacrifice in resistance to hot water and petroleum lubricants. (Author)
AD-669 479 Not available from CFSTI.

LABILE CROSSLINKS IN LOW UNSATURATION ELASTOMERS, II. EFFECT OF CHAIN AND CROSSLINK STRUCTURE ON THERMAL AND OXIDATIVE STABILITY,
Princeton Univ N J Frick Chemical Lab
Peter F. Lyons, Timothy C. P. Lee, and Arthur V. Tobolsky. Apr 68, 35p*
ONR-TR-RLT-106
Contract N00014-67-A-0151

Descriptors: (*Elastomers, *Crosslinking (Chemistry)), Polyethylene plastics, Epoxy plastics, Sulfides, Polymers, Copolymerization, Oxidation, Thermal stability, Heat of activation, Vulcanization.
Identifiers: Ethylene-propylene terpolymers, Ethylene-sulfide propylene-sulfide terpolymers, Polypropylene oxides.

The thermal and oxidative stability of low unsaturation elastomers was studied as a function of chain and crosslink structure by stress relaxation and oxygen absorption techniques. An ethylene-propylene-terpolymer, a propylene oxide copolymer, and an ethylene sulfide-propylene sulfide-terpolymer were used. The thermally labile polysulfide crosslink that results from sulfur cures is a potent antioxidant. The thermal lability is ascribed to an interchange mechanism, with an activation energy of 24 kcal/mole between 100 and 150C. The presence of an atom of oxygen in the chain results in an increased susceptibility to oxidative degradation compared with a hydrocarbon chain. The presence of a sulfur atom in the polymer chain confers a sensitivity to a destructive attack by the active ingredients and products of an accelerated sulfur curing recipe. (Author)
AD-669 497 HC$3.00 MF$0.65

VULCANIZATION OF FLUORINE-CONTAINING POLYMERS,
Yarsley Research Lab Ltd (Gt Brit)
A. Nodar-Blanco, and W. Flavell. Jan 68, 71p*
D-MAT-150

Descriptors: (*Elastomers, Halocarbon plastics), (*Halocarbon plastics, Vulcanization), Fluorine compounds, Heat-resistant plastics, Additives, Ammonium compounds, Aromatic compounds, Sodium compounds, Calcium compounds, Oxides, Compressive properties, Thermal stability, Great Britain.

An investigation was carried out into novel systems for the vulcanization of Viton A, in the hope that vulcanizates displaying improved properties at high temperature (especially with regard to compression set) would result. The following systems were studied: (1) p-Xylylene dihalides in conjunction with sodium alkoxides; (2) 4,4'-dichloromethyl diphenyl oxide in conjunction with sodium alkoxides; (3) quaternary ammonium compounds; (4) dihydric phenols in conjunction with sodium alkoxides; (5) 4,4'dihydroxymethyl diphenyl oxide in conjunction with sodium alkoxides; (6) 4,4'-diazidodiphenyl; (7) 4,4'-diphenyl bis (diazonium fluoroborate); (8) Pyromellitic dianhydride (dipotassium salt); (9) Dihydrophenazine. Systems 1 and 3 were investigated in greatest detail. It was found that quaternary ammonium salts, both bifunctional and monofunctional, are effective vulcanizing agents, the former being the more effective. The preferred vulcanizing system is comprised of a mixture of equal parts of calcium oxide and 1,4-phenylene dimethylene bis (triethyl ammonium chloride). This system gives vulcanizates with compression set at high temperatures superior to those given by dicinnamylidene hexamehtylene diamine. Other mechanical properties and resistance to ageing at 250C in air are similar for vulcanizates prepared with 1,4-phenylene dimethylene bis (triethyl ammonium chloride) and with dicinnamylidene hexamethylene diamine. (Author)
AD-669 684 HC$3.00 MF$0.65

SEPARATOR DEVELOPMENT PHASE OF HEAT- STERILIZABLE BATTERY DEVELOPMENT PROGRAM - BATTERY CASE DEVELOPMENT FINAL REPORT, 10 APR. 1967 - 31 JAN. 1968.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Whittaker Corp., San Diego, Calif. Narmco Research and Development Div.
For primary bibliographic entry see Field 10C.
For abstract, see STAR 06 12.
N68-22707 HC$3.00 MF$0.65

11L. Wood and Paper Products

MARKETING PARTICLEBOARD AND THE FEASIBILITY OF A PROPOSED MILL IN GRANGEVILLE, IDAHO: A TWO PHASE STUDY COVERING MARKETS AND MANUFACTURING.
McKenzie (Thomas A.), Seattle, Wash.
Aug 65, 62p*
Contract C-55-65

Descriptors: (*Wood, Industries), (*Economics, Idaho), Feasibility studies, Manufacturing methods, Costs, Natural resources, Organizations, Wood, Particles, Commerce, Specifications, Consumption, Management planning, Distribution, Volume, Maps.

Contents: General background; Markets for the proposed plant; Suggested marketing plan; Operational feasibility of a particleboard plant in Grangeville, Idaho; and Conclusions and recommendations.
PB-177 692 HC$3.00 MF$0.65

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

ASYMPTOTICALLY EFFICIENT SIMULTANEOUS ESTIMATION OF SEVERAL PARAMETERS.
Columbia Univ New York Psychophysics Lab
For primary bibliographic entry see Field 5J.
AD-669 246 HC$3.00 MF$0.65

THE CLASS OF K-FUNCTIONS ON RIEMANNIAN SPACES.
Technical rept.,
California Univ Los Angeles Dept of Mathematics
Samuel G. Councilman. Apr 68, 83p Rept no. TR-44
AROD-6929:16-M
Grant DA-ARO (D)-31-124-G855
See also AD-649 148.

Descriptors: (*Algebraic topology, Potential theory), Operators (Mathematics), Integral equations, Set theory, Green's function, Theorems, Theses.
Identifiers: Existence theorems.

The class of harmonic functions on a Riemannian n-space which have vanishing flux across all dividing (n-1)-cycles is considered. The tools employed are normal operators, principal functions, and the Main Existence Theorem, all introduced in earlier work of L. Sario. The results constitute an extension to general Riemannian spaces, of arbitrary dimension N = or > 2, of properties known for such a class of functions on a Riemann surface. (Author)
AD-669 260 Not available from CFSTI.

A NEW PREDICTOR-CORRECTOR METHOD FOR QUASILINEAR FIRST-ORDER PARTIAL DIFFERENTIAL EQUATIONS,
Rand Corp Santa Monica Calif
J. L. Casti, H. H. Kagiwada, and R. E. Kalaba.
Apr 68, 19p Rept no. RM-5607-PR
Contract F44620-67-C-0045

Descriptors: (*Partial differential equations, Numerical methods and procedures), Initial value problems, Boundary value problems, Nonlinear systems, Magnetohydrodynamics, Approximation (Mathematics), Iterative methods.
Identifiers: Invariant imbedding, Quasilinearization, Computer analysis.

An effective, efficient method is given, exploiting the techniques of invariant imbedding and quasilinearization, for numerically solving quasilinear first-order partial differential equations. It is known that certain nonlinear two-point boundary-value problems can be converted into initial-value problems for a related quasilinear first-order partial differential equation. It is observed, conversely, that the treatment of the partial differential equation can be reduced to solving the two-point boundary-value problem by using quasilinearization. Use of standard finite difference methods to predict, and quasilinearization to correct, can yield precision solutions for the partial differential equation. (Author)
AD-669 336 HC$3.00 MF$0.65

THE INVARIANT IMBEDDING NUMERICAL METHOD FOR FREDHOLM INTEGRAL EQUATIONS WITH DEGENERATE KERNELS,
Rand Corp Santa Monica Calif
H. H. Kagiwada, R. E. Kalaba, and B. J. Vereeke.
May 68, 31p Rept no. RM-5619-PR
Contract F44620-67-C-0045

Descriptors: (*Integral equations, Numerical methods and procedures), Differential equations, Initial value problems, Cauchy problem, Matrix algebra, Exponential functions, Computer programs.
Identifiers: Invariant imbedding, Eigenvalues, FORTRAN.

The report describes application of invariant imbedding in deriving an initial-value method for solving Fredholm integral equations with degenerate kernels. By regarding the solution at a fixed point as a function of the interval of integration, a differential equation is obtained; this equation, combined with knowledge of the solution for one interval length, makes it possible to determine the solution for other lengths. The principal advantage of the initial-value formulation is its ease of resolution by modern digital and analog computers. Emphasis is on the inhomogeneous problem, although some remarks on the eigenvalue problem are included. A FORTRAN program for solving the initial-value problem is also given, with subroutines written for an Adams-Moulton integration scheme with a Runge-Kutta start. (Author)
AD-669 342 HC$3.00 MF$0.65

RADIATION OF A HERTZ DIPOLE MOVING AROUND A CONDUCTING SPHERE.
California Inst of Tech Pasadena Antenna Lab
For primary bibliographic entry see Field 20N.
AD-669 370 HC$3.00 MF$0.65

GRAPHICAL METHODS IN AEROTHERMODYNAMICS,
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 20D.
AD-669 416 HC$3.00 MF$0.65

ON CHARACTERIZATION OF THE GAMMA DISTRIBUTION.
Technical rept.,
Stanford Univ Calif Dept of Statistics
W. J. Hall, and Gordon Simons. 1 May 68, 15p
Rept no. TR-60
Contract Nonr-225 (72)

Descriptors: (*Statistical distributions, Theorems), Random variables, Sequential analysis, Matrix algebra, Set theory.
Identifiers: Gamma distributions, Characteristic functions.

Let X sub 1, X sub 2,... be a sequence of i.i.d. random variables and S sub n = summation, j = 1 to j = n, of X sub j. If X sub 1 has a gamma distribution, (Z sub n is identically equal to S (subscript n, superscript r)/E (S subscript n, superscript r)); n = or > 1) is a reverse martingale sequence for any positive r. These reverse martingales find applications in sequential analysis. In this paper the converse is proved for any integer r > 1, and this provides a characterization of the gamma distribution; in fact, it is sufficient that the reverse martingale sequence have finite length r. Another characterization is also proved, extending the case r = 2 to non-identically distributed r.v.'s. (Author)
AD-669 463 HC$3.00 MF$0.65

AN ECONOMETRIC MODEL OF UNITED STATES GOVERNMENT REVENUES AND EXPENDITURES,
George Washington Univ Washington D C Logistics Research Project
For primary bibliographic entry see Field 5C.
AD-669 464 HC$3.00 MF$0.65

ON THE MATRICES AB AND BA,
California Univ Santa Barbara
R. C. Thompson. Apr 68, 18p
AFOSR-68-0991
Grant AF-AFOSR-698-67
Availability: Published in Linear Algebra and Its Applications, v1 p43-58 1968.

Descriptors: (*Matrix algebra, Theorems), Ine-

qualities, Sequences, Transformations (Mathematics), Linear systems.
Identifiers: Eigenvalues.

The paper presents a complete analysis of the relationship between matrices A, B, P, Q when P = AB and Q = BA. (Author)
AD-669 474 Not available from CFSTI.

THE BRACHISTOCHRONE PROBLEM SOLVED BY INVARIANT IMBEDDING, DYNAMIC PROGRAMMING AND QUASILINEARIZATION METHODS.
Technical rept.,
Houston Univ Tex Dept of Mechanical Engineering
M. Z. Lee, and D. Muster. May 67, 87p Rept no. TR-6
Contract Nonr-4492 (01)

Descriptors: (*Programming (Computers), Problem solving), (*Calculus of variations, Boundary value problems), (*Boundary value problems, *Optimization), (*Orbital trajectories, Problem solving), Initial value problems, Dynamic programming, Numerical methods and procedures, Approximation (Mathematics), Flow charting, Computer programs.
Identifiers: Brachistochrone problem, Invariant imbedding, Quasilinearization, Optimal control theory.

In such fields of current interest as optimal control and orbit determination, non-linear two-point boundary-value problems arise, the numerical solutions for which are difficult to obtain. In this report, some of the useful tools for treating problems of this nature - invariant imbedding, dynamic programming, and quasilinearization are studied by means of the brachistochrone problem. The three approaches are used separately and in combination. Computer programs using MAD language are presented. The results are compared with the classical solutions. (Author)
AD-669 496 HC$3.00 MF$0.65

HONEST OPTIONAL STOPPING.
Technical rept.,
Stanford Univ Calif Dept of Statistics
R. A. Olshen, and D. O. Siegmund. 8 Apr 68, 11p Rept no. TR-134
Contract Nonr-225 (52)

Descriptors: (*Probability, Theory), Stochastic processes, Distribution functions, Sequences, Random variables, Theorems.
Identifiers: Stopping rules.
AD-669 500 HC$3.00 MF$0.65

SELF-ADJUSTING SYSTEM WITH NONLINEAR MODEL (SAMONASTRAIVAYUSHCHAYASYA SISTEMA S NELINEINOI MODELYU),
Foreign Technology Div Wright-Patterson AFB Ohio
S. A. Babushkin. 4 Aug 67, 30p Rept no. FTD-MT-24-132-67
Edited machine trans. of mono. Vsesoyuznaya Konferentsiya po Teorii i Praktuke, Samonastraivayushchikhsy
a Sistem, 10-14 Dec 63. Trudy 1, Moscow, 1965 p64-77 (also pub. as mono. Samonastraivayushchiesya
Sistemy, Moscow, 1965).

Descriptors: (*Adaptive control systems, Nonlinear systems), Spacecraft, Equations of motion, Automation, Mathematical models, Perturbation theory, USSR.
Identifiers: Translations, Variatiónal principles, Computer analysis, Automatic control systems.

Synthesis of the controller of a nonlinear adaptive system with outside disturbances is described. Control law equations are derived from the original state equations using variational methods. The variables are divided into two basic groups: directly observable and nonobservable. The latter are expressed as functions of the first. The problem of flight control of a variable mass body moving in the vicinity of Earth is considered as an example. A set of equations serving as the basis of the control law is derived and a block diagram of a special purpose computer to implement this control law is presented.
AD-669 515 HC$3.00 MF$0.65

RELATIONS BETWEEN THE CALCULUS OF VARIATIONS AND BOUNDARY VALUE PROBLEMS.
Final scientific status rept. 1 Oct 64-31 Mar 68,
Oklahoma Univ Norman Dept of Mathematics
William T. Reid. Apr 68, 4p
AFOSR-68-0966
Grant AF-AFOSR-749-65

Descriptors: (*Calculus of variations, *Boundary value problems), Integral equations, Matrix algebra, Differential equations, Control systems, Optimization, Operators (Mathematics).
Identifiers: Limit theorems, Optimal control theory.

Brief summaries are given of contributions in the following areas: Oscillation and comparison theorems for ordinary linear differential systems on the real line, and attendant spectral theory results; The qualitative nature of solutions of differential systems; Riccati matrix differential equations and generalizations; A particular type of optimal control problem; Generalized inverses of differential and integral operators, with particular attention to the concept of a generalized Green's matrix. (Author)
AD-669 529 HC$3.00 MF$0.65

SECOND-ORDER LINEAR PARABOLIC EQUATIONS WITH A SMALL PARAMETER,
New York Univ N Y Courant Inst of Mathematical Sciences
Larry Bobisud. May 68, 15p
AFOSR-68-0967
Grant AF-AFOSR-537-67
Availability: Published in Archive for Rational Mechanics and Analysis, v27 n5 p385-97 1968.

Descriptors: (*Partial differential equations, Problem solving), Boundary value problems, Operators (Mathematics), Convergence, Theorems.
Identifiers: Asymptotic expansions, Maximum principle.

The first boundary value problem for a second-order linear parabolic equation in two variables x and t and with a small parameter epsilon multiplying the u sub (xx) term is studied as epsilon tends to zero. The cases where the lateral boundaries are or are not characteristics of the equation with epsilon = 0 are examined, and in both cases an asymptotic expansion, with boundary layer terms, for the solution u sub epsilon (x,t) is found and proved valid uniformly on the domain. (Author)
AD-669 530 Not available from CFSTI.

A DECOMPOSITION FOR L (SUPERSCRIPT 1)-BOUNDED MARTINGALES,
Purdue Univ Lafayette Ind Dept of Statistics
Richard F. Gundy. May 68, 7p
AFOSR-68-0968
Grant AF-AFOSR-955-65
Prepared in cooperation with Rutgers-The State Univ., New Brunswick, N. J.
Availability: Published in The Annals of Mathematical Statistics, v39 n1 p134-8 1968.

Descriptors: (*Statistical analysis, Inequalities), Random variables, Statistical distributions, Mapping (Transformations), Sequences, Convergence, Theorems.
Identifiers: Decomposition theorems.

A decomposition for L (superscript 1)-bounded martingales is presented and subsequently used to derive inequalities for maximum and sums of square differences of the martingale. (Author)
AD-669 532 Not available from CFSTI.

DETERMINANTS, PERMANENTS AND BIPARTITE GRAPHS,
Rand Corp Santa Monica Calif
Frank Harary. May 68, 10p Rept no. P-3840

Descriptors: (*Graphics, *Matrix algebra), (*Combinatorial analysis, Matrix algebra), Permutations, Determinants, Theorems.
Identifiers: Permanents (Matrix algebra).

The combinatorial properties of a nonnegative matrix M are captured by that binary matrix A = A (M) in which the entries are 1 whenever those of M are positive. If A is a square matrix, then it can be regarded as the adjacency matrix of a directed graph (digraph). If A is rectangular, a bipartite graph (bigraph) can be associated with A; of course this can also be done for A square. The determinant of the adjacency matrix of a graph or digraph has been expressed in terms of its structure, and so has the permanent. The purposes of this report are to express the permanent of a square or rectangular binary matrix in terms of the associated bigraph, and to formulate the determinant of a square matrix in terms of its bigraph. (Author)
AD-669 561 HC$3.00 MF$0.65

STABILITY OF SOME NONLINEAR SYSTEMS,
California Univ Berkeley Structural Engineering Lab
Naser Mostaghel, and Jerome L. Sackman. Feb 68, 75p Rept no. SEL-68-2
Contract DA-31-124-ARO (D)-460

Descriptors: (*Beams (Structural), Loading (Mechanics)), Stability, Nonlinear systems, Perturbation theory, Approximation (Mathematics), Fourier analysis, Differential equations, Series, Inequalities, Theorems.
Identifiers: Lyapunov functions, Computer analysis.

The stability of systems governed by x double dot + f (x) + q (x, x dot)x dot - phi (t) r (x) = S (x;t) is studied. Liapunov's Direct Method and a linearization approach have been used in the study of stability of the above system for phi (t) L sub 1 integrable, and periodic, respectively. In the former case a sufficiency region of stability is constructed through the use of a Liapunov function. In the latter case, which is investigated by means of a linearization process, a Hill equation is obtained, whose stability is studied by a method suggested by Malkin. Malkin's method is then modified to obtain, by use of a first approximation, the first stability region in parameter space. A second approximation is also worked out. When the approximations obtained herein for general periodic function are reduced to the special cases of the Mathieu equation and the Hill-3-term equation, the results compare very well with the available numerical results based on the exact solution of each of those equations. (Author)
AD-669 630 HC$3.00 MF$0.65

THE CONVERGENCE OF SEQUENCES OF RATIONAL FUNCTIONS OF BEST APPROXIMATION. III,
Maryland Univ College Park Dept of Mathematics
J. L. Walsh. 10 May 68, 19p
AFOSR-68-1066-Pt-3
Grant AF-AFOSR-1130-66
See also Part 2, AD-638 915.
Availability: Published in Transactions of the American Mathematical Society, v130 n1 p167-83 1968.

Descriptors: (*Functional analysis, Approximation (Mathematics)), (*Approximation (Mathematics), Sequences), (*Sequences, Convergence),

Functions, Complex variables, Set theory, Polynomials, Inequalities, Theorems.
Identifiers: Asymptotic behavior.

The present paper is a continuation of several papers on the same general topic, and serves to give both details of some results previously mentioned without proof and further refinements of results already set forth. A function of type (j,k) is defined as a rational function of the form (a (sub o) z (superscript j) + a (sub 1) z (superscript j-1) + ... + a sub j) all divided by the quantity (b (sub o) z (superscript k) + b (sub 1) z (superscript k-1) + ... + b sub k), with the condition that Summation of the absolute values of b sub i is not equal to zero, and one studies convergence as n approaches infinity of approximating functions of both types (n,v) and (v,n), where v is constant. The new results are concerned not primarily with Tchebycheff norms as in the former papers, but more especially with norms (q>0) involving line integrals. (Author)
AD-669 660 Not available from CFSTI.

METHOD FOR SOLVING THE KORTEWEG-deVRIES EQUATION,
Princeton Univ N J Plasma Physics Lab
Clifford S. Gardner, John M. Greene, Martin D. Kruskal, and Robert M. Miura. May 68, 6p
AFOSR-68-1021
Contract AF 49 (638)-1555
Availability: Published in Physical Review Letters, v19 n19 p1095-7 Nov 1967.

Descriptors: (*Wave transmission, Initial value problems), (*Initial value problems, Problem solving), Ocean waves, Magnetohydrodynamics, Plasma oscillations, Partial differential equations, Propagation, Interactions.
Identifiers: Korteweg-deVries equation, Solitons, Ion-acoustic waves, Acoustic waves, Wave equation.

A method for solving the initial-value problem of the Korteweg-deVries equation is presented which is applicable to initial data that approach a constant sufficiently rapidly as the absolute value of chi approaches infinity. The method can be used to predict exactly the 'solitons,' or solitary waves, which emerge from arbitrary initial conditions. Solutions that describe any finite number of solitons in interaction can be expressed in closed form. (Author)
AD-669 667 Not available from CFSTI.

A FORTRAN II PROGRAM FOR MUDAID: MULTIVARIATE, UNIVARIATE, AND DISCRIMINANT ANALYSIS OF IRREGULAR DATA,
Illinois Univ Urbana Dept of Psychology
Mark Appelbaum, and Rolf E. Bargmann. Dec 67, 95p
Contracts Nonr-1834 (39), N00014-67-A-0305

Descriptors: (*Multivariate analysis, Programming (Computers)), Factor analysis, Combinatorial analysis, Statistical distributions, Analysis of variance, Matrix algebra, Computer programs.
Identifiers: FORTRAN, Discriminant analysis, Likelihood ratio tests.

A FORTRAN II program for a Multivariate, Univariate, and Discriminant Analysis of Irregular Data (MUDAID) is presented. This program is an extension of the programs ANOT and SLTD of the IBM Components Division to provide multivariate and discriminant analysis options. The data may be irregular both in the sense of unequal and non-proportional numbers of observations per factor combination in design of experiments and in the sense of unedited data obtained from automated data recording devices. A first run of the program with a body of data produces indications of outlier observations and other peculiarities to be adjusted in editing. A complete description of the method of analysis and usage is given as well as a complete listing of the program. (Author)
AD-669 696 HC$3.00 MF$0.65

SOLUTIONS OF A SPECIAL RECONNAISSANCE GAME
RAND Corp., Santa Monica, Calif.
For primary bibliographic entry see Field 15G.
ATI-210 325 HC$3.00

THE PROGRAMMERS HANDBOOK. A COMPENDIUM OF NUMERICAL ANALYSIS UTILITY PROGRAMS,
Union Carbide Corp., Oak Ridge, Tenn. Computing Technology Center.
R. E. Funderlic. 9 Feb 68, 299p*
Contract W-7405-eng-26

Descriptors: (*Numerical analysis, *Programming (Computers)), Curve fitting, Interpolation, Least squares method, Matrix algebra, Functional analysis, Vector analysis, Fourier analysis, Series, Random variables, Computer programs.
Identifiers: FORTRAN, IBM 360 computers.

For abstract, see NSA 22 10.
K-1729 HC$3.00 MF$0.65

STUDY OF NON-LINEAR DIRICHLET PROBLEMS,
Oak Ridge Gaseous Diffusion Plant, Tenn.
Dale W. Lick, and J. Nelson Tunstall. 27 Feb 68, 36p
Contract W-7405-eng-26

Descriptors: (*Partial differential equations, Numerical analysis), (*Potential theory, Nonlinear systems), Boundary value problems, Operators (Mathematics), Approximation (Mathematics), Matrix algebra, Iterative methods, Convergence, Corrosion, Diffusion, Theorems.
Identifiers: Dirichlet problems, Eigenvalues.

For abstract, see NSA 22 10.
K-1737 HC$3.00 MF$0.65

STABILITY OF THE NEW RADIO FLASH CODE,
Los Alamos Scientific Lab., N. Mex.
R. D. Richtmyer. Aug 67, 15p
Contract W-7405-eng-36

Descriptors: (*Electromagnetic fields, Mathematical models), (*Difference equations, Stability), Initial value problems, Boundary value problems, Integral transforms, Interfaces.
Identifiers: Computer analysis, Radio flash codes, Maxwells equations.

For abstract, see NSA 22 10.
LA-3864 HC$3.00 MF$0.65

ON THE CONSTRUCTION OF HIGHLY STABLE, EXPLICIT, NUMERICAL METHODS FOR INTEGRATING COUPLED ORDINARY DIFFERENTIAL EQUATIONS WITH PARASITIC EIGENVALUES.
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
H. Lomax. Apr 68, 46p NASA-TN-D-4547
Contract 129-04-03-02-00-21

Descriptors: *Differential equations, *Eigenvalues, *Numerical integration, Matrices (mathematics), Nonlinear equations, Optimization, Theorem proving.

For abstract, see STAR 06 12.
N68-21978 HC$3.00 MF$0.65

CONDITIONS FOR ASYMPTOTIC STABILITY OF THE DISCRETE, MINIMUM VARIANCE, LINEAR ESTIMATOR.
Massachusetts Inst. of Tech., Cambridge. Experimental Astronomy Lab.
J. J. Deyst, Jr., and C. F. Price. Mar 68, 14p
NASA-CR-94292, RE-41
Contract NGR-22-009-207

Descriptors: *Discrete functions, *Estimating, *Optimization, *Stochastic processes, Asymptotic methods, Formulas (mathematics), Statistical analysis, Variance (statistics).

For abstract, see STAR 06 12.
N68-22025 HC$3.00 MF$0.65

APPROXIMATE SOLUTION OF SYSTEM OF SINGULAR INTEGRAL EQUATIONS.
Lehigh Univ., Bethlehem, Pa. Inst. of Research.
F. Erdogan. 1968, 29p NASA-CR-94170
Contract NGR-39-007-011

Descriptors: *Approximation, *Singular integral equations, Hypergeometric functions, Orthogonal functions, Polynomials, Simultaneous equations.

For abstract, see STAR 06 12.
N68-22041 HC$3.00 MF$0.65

TWO NOTES ON PERTURBATION THEORY. 1 - INTERCHANGE THEOREMS AND THE VARIATION PRINCIPLE. 2 - PV IN A DIFFERENT NOTATION.
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
S. T. Epstein. 19 Feb 68, 8p NASA-CR-94333, WIS-TCI-286
Grant NSG-275-62

Descriptors: *Hartree approximation, *Perturbation theory, *Theorems, *Variational principles, Numerical analysis, Rayleigh distribution, Schroedinger equation, Theoretical physics, Wave equations.

For abstract, see STAR 06 12.
N68-22203 HC$3.00 MF$0.65

FINITE STATE STOCHASTIC GAMES - EXISTENCE THEOREMS AND COMPUTATIONAL PROCEDURES.
Brown Univ., Providence, R. I.
S. G. Chamberlain, and H. J. Kushner. 1967, 22p NASA-CR-94428
Contracts NGR-40-002-015, AF-AFOSR-693-67

Descriptors: *Existence theorems, *Saddle points (game theory), *Stochastic processes, Lattices (mathematics), Optimization, Strategy, Theorem proving, Transition probabilities.

For abstract, see STAR 06 12.
N68-22805 HC$3.00 MF$0.65

GENERAL LAGRANGIAN INTERPOLATION FORMULAS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
C. E. Velez. May 68, 17p NASA-TN-D-4424
Contract 150-22-12-75-51

Descriptors: *Differential calculus, *Interpolation, *Polynomials, Boundary value problems, Coefficients, Derivation, Formulas (mathematics), Quadratic equations.

For abstract, see STAR 06 12.
N68-22809 HC$3.00 MF$0.65

PROLONGED RESISTANCE OF FIBERGLASS REINFORCED PLASTICS UNDER BIAXIAL COMPRESSION BY A CONSTANT LOADING,
Lockheed Missiles and Space Co., Palo Alto, Calif.
For primary bibliographic entry see Field 11I.
PB-176 847T HC$3.00 MF$0.65

NOTES ON THE THEORETICAL BASIS OF THE EQUATIONS FOR THE ATMOSPHERE'S SURFACE LAYER.

Atmospheric Turbulence and Diffusion Lab., Oak Ridge, Tenn.
For primary bibliographic entry see Field 4A.
PB-177 327 HC$3.00 MF$0.65

12B. Operations Research

SENSITIVITY OF TIME-VARYING LINEAR OPTIMAL CONTROL SYSTEMS.
Grumman Aircraft Engineering Corp Bethpage N Y Research Dept
E. Kreindler. May 68, 19p Rept no. RE-327J
Availability: To be published in Journal of Optimization Theory and Applications.

Descriptors: (*Control systems, Optimization), Sensitivity, Inequalities, Feedback, Linear systems, Mathematical models, Theorems.
Identifiers: *Optimal control theory, Sensitivity analysis, Closed-loop control systems.

The fundamental question 'In what precise sense, if any, is the closed-loop realization of an optimal control system less sensitive to parameter variations than the nominally equivalent open-loop system.' is answered for time-varying linear optimal control systems. It is shown that there is a closed-loop sensitivity reduction in terms of an inequality involving a particular integral-square of the first-order variation of the state due to first-order variations of plant parameters. (Author)
AD-669 264 Not available from CFSTI.

ON SUBOPTIMIZATION: AN EXAMPLE.
Final rept.,
Center for Naval Analyses Washington D C
J. M. Danskin. 17 Jun 66, 10p Rept no. Research contrib-22
Contract Nonr-3732 (00)

Descriptors: (*Optimization, Problem solving), Operations research, Game theory, Exponential functions, Numerical methods and procedures, Economics.
Identifiers: *Suboptimization principle, Max-min problems, Allocation processes.

In certain allocation problems concerning groups of systems, it is possible to allocate by allocating within each system and then combining the results. This paper shows that while this method is correct for pure maximum problems and for cases in which the overall problem is a game, it is not true for Max-Min problems. (Author)
AD-669 291 HC$3.00 MF$0.65

USER'S INSTRUCTIONS FOR 0-1 INTEGER LINEAR PROGRAMMING CODE RIP30C,
Rand Corp Santa Monica Calif
A. M. Geoffrion, and A. B. Nelson. May 68, 33p Rept no. RM-5627-PR
Contract F44620-67-C-0045

Descriptors: (*Linear programming, Programming (Computers)), (*Programming (Computers), Problem solving), Algorithms, Numerical methods and procedures, Computer programs, Efficiency.
Identifiers: Integer programming, RIP30C computer program, Balasian algorithm, FORTRAN.

This Memorandum furnishes the information required in order to use 0-1 integer linear programming code RIP30C. Included is a discussion of input and output, an example, and a listing of the code. (Author)
AD-669 322 HC$3.00 MF$0.65

SUPPRESSING NATURAL OSCILLATIONS IN NONLINEAR COMBINED SYSTEMS (PODAVLENIE AVTOKOLEBANII V NELINEINYKH KOMBINIROVANNYKH SYSTEMAKH),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13H.
AD-669 429 HC$3.00 MF$0.65

FIRST-ORDER CERTAINTY EQUIVALENCE.
Technical rept.,
California Univ Berkeley Center for Research in Management Science
E. Malinvaud. Apr 68, 26p Rept no. TR-27
Contract Nonr-222 (77)
Research supported in part by National Science Foundation. See also Technical report no. 15, AD-426 886.

Descriptors: (*Decision theory, Stochastic processes), (*Management planning, Optimization), (*Dynamic programming, Management planning), Probability, Mathematical models, Uncertainty, Game theory, Approximation (Mathematics), Problem solving.
Identifiers: Resource allocation, Certainty equivalence.

Given any problem of decision under risk to which the expected utility hypothesis applies, one may associate to it first a riskless problem in which random disturbances are replaced by their expected values, and second a class of intermediate risky problems with decreasing degrees of uncertainty. In this class the optimal decision depends in principle on the degree of uncertainty but turns out to be independent of it, to the first order of approximation, in the neighborhood of the riskless problem. The first-order certainty equivalence explains why it is so difficult to characterize the situations in which an increase in the degree of uncertainty requires a decrease in the allocation of resources to the risky projects. (Author)
AD-669 465 HC$3.00 MF$0.65

INVESTIGATION OF NONLINEAR CONTROL SYSTEMS. PART 8. OSCILLATIONS IN CONTROL SYSTEMS,
Minorsky (Nicholas) Aix-en-Provence (France)
Nicholas Minorsky. Apr 67, 215p
Contract N62558-4544
See also Part 7, AD-641 261.

Descriptors: (*Control systems, Nonlinear systems), (*Oscillation, Control systems), Numerical analysis, Stroboscopes, Linear systems, Topology, Approximation (Mathematics), Curve fitting, Matrix algebra, Differential equations.

This report is devoted to the general survey of methods dealing with oscillations in control systems. Chapter headings include Outline of the classical theory; Stroboscopic method; Piece-wise linear idealization; Piece-wise linear theory and Programming control. The work is Part 8 of a general investigation of Nonlinear Control Systems.
AD-669 523 HC$3.00 MF$0.65

RANDOM SEARCH IN OPTIMIZATION PROBLEMS FOR MULTIPARAMETER SYSTEMS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13H.
AD-669 542 HC$3.00 MF$0.65

MULTI-QUEUES WITH CHANGEOVER TIMES.
Doctoral thesis,
Massachusetts Inst of Tech Cambridge Operations Research Center
Martin Eisenberg. Apr 68, 145p Rept no. TR-35
Contracts DA-31-124-ARO (D)-209, Nonr-3963 (06)

Descriptors: (*Queueing theory, Optimization), Mathematical models, Iterative methods, Decision theory, Statistical processes, Probability, Theses.

The problem of a queuing system with changeover times is studied to determine the effect of the queue discipline. Several specific disciplines for the two-line case are investigated and compared. The alternating priority and strict priority disciplines are investigated for the general two-line system. A class of disciplines are analyzed for the two-line system with zero changeover times. For alternating priority, the mean waiting times are obtained and it is shown how higher moments may be derived. For each of the other disciplines, explicit expressions for the Laplace-Steiltjes transforms of the waiting time distributions are obtained and the means of these distributions are computed. The non-saturation condition and several other measures of performance are found in each case. The technique used throughout is the application of generating functions to the 'imbedded' process formed at the instants of service-completion. In an appendix the mean waiting time of an arbitrary customer is obtained for a specialized K-line system. The mean waiting times for various disciplines are compared for a specific system. It is observed that disciplines which increase the idle time do not necessarily decrease the waiting time, and in fact, might cause the waiting time to increase. It is shown that disciplines which are potentially optimum can be classified in a general way. The specific disciplines studied are found to fall into this classification. (Author)
AD-669 628 HC$3.00 MF$0.65

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13B. Civil Engineering

INJECTION WELL, EARTHQUAKE RELATIONSHIP ROCKY MOUNTAIN ARSENAL, DENVER, COLORADO.
Rept. of Investigations.
Army Engineer District Omaha Nebr
1 Oct 66, 238p

Descriptors: (*Wastes (Industrial), Underground structures), (*Earthquakes, Colorado), Disposal, Well logging, Contamination, Injection, Pressure, Shallow water, Plants (Botany), Damage, Seismology, Dams, Geological survey, Epicenter, Data, Rock (Geology).
Identifiers: Injection wells.

The report covers the results of investigations by the U. S. Army Engineer District, Omaha, Nebraska, into the possibility of a relationship between the operation of the injection well at Rocky Mountain Arsenal and the earthquakes that have been recorded in the vicinity of Derby, Colorado. (Author)
AD-669 600 HC$3.00 MF$0.65

PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1966 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART I. ATMOSPHERIC SCIENCES,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 4A.
For abstract, see NSA 22 10.
BNWL-481-1-Vol-2-Pt-1 HC$3.00 MF$0.65

COLLECTION OF PRECIPITATION FROM BITUMEN-SAND PAVED AREAS,
Joint Publications Research Service, Washington, D. C.
Sh. M. Annamuradov. 11 Mar 68, 12p
Trans. of Problemy Osvoeniya Pustyn (USSR) v1 n1 p51-6 1967.

Descriptors: (*Dams, USSR), (*Atmospheric precipitation, Collecting methods), Rainfall, Water supplies, Diagrams, Water tanks.
JPRS-44638 HC$3.00 MF$0.65

HYGIENE EFFECTS AND CONTROL OF DUSTS, FOGS, GASES, VAPOURS, RADIOACTIVE PARTICLES.
Israel Program for Scientific Translations, Ltd., Jerusalem.

1967, 42p TT-67-51408/6
Tran- Transl. Into English From German Spon- Published for Health, Educ. and Welfare and Nsf Seri- Its Staub-reinhalt. Der Luft, Vol. 27, No. 6, Jun. 1967

Descriptors: *Air pollution, *Health, *Radioactive contaminants, Combustion products, Dust, Exhaust gases, Hygiene.

For abstract, see STAR 06 12.
N68-22756 HC$2.00 MF$0.65

RESEARCH ON BUOYANT PLUMES ANNUAL REPORT, 1967.
Waterloo Univ. (Ontario). Dept. of Mechanical Engineering.
Jan 68, 120p NYO-3685-13
Contract AT/30-1/-3685

Descriptors: *Buoyancy, *Chimneys, *Plumes, Gusts, Motion stability, Wind effects, Wind tunnel stability tests.

For abstract, see STAR 06 12.
N68-22841 HC$3.00 MF$0.65

HYGIENE EFFECTS AND CONTROL OF DUSTS, FOGS, GASES, VAPOURS, RADIOACTIVE PARTICLES.
Israel Program for Scientific Translations, Ltd., Jerusalem.
1967, 42p TT-67-51408/4
Tran- Transl. Into English From German Spon- Published for Health, Educ. and Welfare and Nsf Seri- Its Staub-reinhalt. Der Luft, Vol. 27, No. 4, Apr. 1967

Descriptors: *Air pollution, *Air purification, *Air sampling, *Atmospheric composition, *Environmental control, Aerosols, Air filters, Combustion products, Dust collectors, Electrostatic precipitators.

For abstract, see STAR 06 12.
N68-22993 HC$2.00 MF$0.65

HYGIENE EFFECTS AND CONTROL OF DUSTS, FOGS, GASES, VAPOURS, RADIOACTIVE PARTICLES.
Israel Program for Scientific Translations, Ltd., Jerusalem.
1967, 48p TT-67-51408/5
Tran- Transl. Into English From German Spon- Published for Health, Educ. and Welfare and Nsf Seri- Its Staub-reinhalt. Der Luft, Vol. 27, No. 5, May 1967

Descriptors: *Dust, *Industries, *Metal particles, *Powder (particles), Air pollution, Aluminum oxides, Combustion products, Contaminants, Dirt, Electron microscopes, Hygiene, Iron oxides, Manganese oxides, Polymers, Space debris.

For abstract, see STAR 06 12.
N68-23025 HC$2.00 MF$0.65

INDEXED BIBLIOGRAPHY OF NUCLEAR DESALINATION LITERATURE-1.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 7A.
For abstract, see NSA 22 10.
ORNL-NDIC-3 HC$3.00 MF$0.65

EVALUATION OF BOUNDARY ALTERNATIVES FOR PROPOSED UPPER GREAT PLAINS ECONOMIC DEVELOPMENT REGION.
Upper Midwest Research and Development Council, Minneapolis, Minn.
Dec 66, 44p

Descriptors: (*Management planning, *Urban areas), (*Rural areas, Management planning), Area coverage, Economics, Advanced planning, Transportation, Costs, Mapping, Graphics, Decision making, Employment, Money, Public opinion, Population, Natural resources, Agriculture, Industries, Inequalities, Terrain, Montana, Nebraska, North Dakota, South Dakota, Wyoming.
Identifiers: Area planning + development, *Upper Great Plains Economic Development Region.

The Economic Development Administration has asked the Upper Midwest Research and Development Council to evaluate possible boundary alternatives for the proposed Upper Great Plain Economic Development Region. This study will evaluate various boundary alternatives within a five-state area which included Nebraska, North and South Dakota, Montana and Wyoming. This Act has a single primary objective, that is, 'to create a climate conducive to the development of private enterprises in America's economically distressed communities.' It does this by encouraging local initiative to design and implement community redevelopment in partnership with government. Hopefully, this will be one important step in harnessing the economic potential of areas that have been outside the mainstream of the nation's prosperity. (Author)
PB-176 883 HC$3.00 MF$0.65

VEHICLE SPRAY PATTERN STUDY.
Final rept.,
Minnesota Dept. of Highways. Traffic Engineering Section.
Jack W. Anderson, and Glen C. Carlson. 17 Aug 66, 40p* Investigation-338

Descriptors: (*Vehicles, *Sprays), (*Signals, Visibility), Safety, Design, Analysis, Brightness, Test facilities, Minnesota, Roads, Traffic, Ranges (Distance), Night vision, Instrumentation.
Identifiers: Spray patterns.

The purpose of this study was to investage the pattern of spray from passing vehicles with respect to determining the optimum lateral and verticle placement of milepost markers for an Interstate-type highway with wide, paved shoulders. Quantitiative data are presented from highway test installations over an 18-month study period. Daytime brightness retention was very high, and no vehicle spray pattern or accumulation rate was obtainable from this data. Photographs presented in the report show the change in appearance of the signs after the 18-month test period, but do not give a true comparison of the relative brightness of the signs. Nighttime brightness readings of reflex reflection proved to be the most effective instrumentation in determining the vehicle spray pattern. From isobrightness curves showing bands of equal nighttime brightness retention, it was found that the optimum sign placement was 14 feet out and six feet above the edge of the pavement. Placing signs at this location would have resulted in a nighttime brightness retention of over 50 percent for all the test signs in this study. (BPR Abstract)
PB-177 369 HC$3.00 MF$0.65

THE DEVELOPMENT OF ULTRASONIC NON-DESTRUCTIVE TESTING INSTRUMENTATION TO MEASURE PAVEMENT THICKNESS.
Ohio State Univ., Columbus. Engineering Experiment Station.
For primary bibliographic entry see Field 14B.
PB-177 378 HC$3.00 MF$0.65

BITUMINOUS PAVEMENT CONSTRUCTION.
Research and Development rept.,
Bureau of Public Roads, Washington, D. C. Structures and Applied Mechanics Div.
M. J. Kilpatrick, and R. G. McQuate. Jun 67, 53p*

A compilation of data and conclusions from Staff research studies of Bituminous pavement compaction equipment, construction methods, and nondestructive test procedures.

Descriptors: (*Pavements, Asphalt), Joints, Construction, Construction materials, Design, Thickness, Density, Systems engineering, Analysis, Compacting, Non-destructive testing, Quality control, Roads.

Semihot and cold joint densities were found to be slightly lower and air flows higher than in the abutting lanes. Infrared heating of the joint appeared to be the better of several methods tested for improving semihot and cold joint quality. Hot joints, constructed by paving in echelon, had the highest quality of all joint types studied. Paver speed was not found to be a significant factor in final lane density. The primary advantage of pneumatic-tired rollers, both at the breakdown and intermediate stage, was found to lie in the ability of pneumatic tires to seal the pavement surface and thus reduce the air flow. With respect to density, no particular advantage could be found in performing breakdown rolling with pneumatic rollers as compared to a steel three-wheel or tandem roller. The value of high rolling temperatures was verified. The highest densities were obtained when breakdown rolling was accomplished at temperatures above 220 degree F. When roller operators were allowed to follow their normal rolling procedures, it was found that the compactive effort at the center of the lane was from three to six times greater than at the lane edges. Two newly-developed nondestructive test methods - nuclear density and air flow - were used in addition to conventional test methods to measure pavement and joint quality. It was found that the accuracy of these nondestructive tests was affected to a significant degree by surface texture of the pavement. It is recommended that these two tests be used to measure compaction on a relative, rather than absolute basis. (BPR Abstract)
PB-177 383 HC$3.00 MF$0.65

COMPREHENSIVE SETTLEMENT STUDY OF THE INTERSTATE FILL ACROSS THE JAMES RIVER.
Interim rept.,
South Dakota Dept. of Highways. Foundation Section.
Kenneth E. Anderson, and Walter W. Grimes. 1 Mar 67, 62p
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Descriptors: (*Soil mechanics, Civil engineering), (*Roads, Soil mechanics), Stratigraphy, Stability, Instrumentation, Analysis, Meters, South Dakota.
Identifiers: Consolidation.

The study concerns the stability and settlement of a long approach fill over thick compressible soils in the James River Valley, one mile south and two miles east of Michell, South Dakota. The report includes a very brief description of the study and its objectives; preconstruction analyses and calculations, and construction observations. It describes field instrumentation and problems and summarizes data obtained through the construction phase. It also includes recommendations for future fill studies. (BPR Abstract)
PB-177 385 HC$3.00 MF$0.65

STUDY AND EVALUATION OF PAVEMENT CONDITION EQUIPMENT.
Interim rept.,
Ohio Dept. of Highways, Columbus.
F. B. Hillman, J. R. Boylan, R. G. Lozano, and F. E. Behn. 3 Aug 67, 138p*
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Descriptors: (*Pavements, Test methods), (*Surface properties, Test equipment), Models (Simulations), Test equipment, Measurement, Roughness, Skidding, Instrumentation, Vibration, Etching, Composite materials, Ohio, Flexible structures, Statistical analysis, Tables.
Identifiers: Roughometers, CHLOE profilometers, Profilographs, Portable skid testers, Skid resistance.

The study is an attempt by the Ohio Department of Highways to evaluate general systems used in determining pavement roughness and skid resistance. The instruments evaluated are (1) the Bureau of Public Roads Road Roughness Indicator, (2) the CHLOE Profilometer, (3) the California

Profilograph and (4) the British Portable Skid Resistance Tester. Tabulated data and the resulting graphs and figures are presented. (BPR Abstract)
PB-177 463 HC$3.00 MF$0.65

CHANGES IN AVERAGE TRIP LENGTH,
Chicago Area Transportation Study, Ill.
Walter D. Stoll. Dec 67, 37p*
A case Study by Mode and Purpose of Skokie Trips made in 1956 and 1964. Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Descriptors: (*Urban planning, *Transportation), Advanced planning, Statistical analysis, Railroads, Passenger vehicles, Environment, Motivation, Sociology, Traffic, Economics, Illinois.
Identifiers: Skokie (Illinois), Chicago (Illinois).

The recommendations made by the Chicago Area Transportation Study, CATS, for the 1980 transportation requirements of its study area have been based in part upon an estimate of the total daily mileage which will be traveled within the area by that time. This estimate of person miles has been determined by multiplying the estimated future number of trips by the estimated future average trip length. It is partially from the refinement of these two basic factors that the CATS recommendations have evolved. Controversy has arisen over the use of the second factor, average trip length, in making estimates of future transportation requirements. There are two schools of thought concerning future average trip length. One group, including CATS, has based its planning on the assumption that the future average trip length for the metropolitan area will remain fairly constant. The second school of thought bases its projections on the assumption that the future average trip length will increase. A third possibility, a decrease in over-all average trip length, does not seem to be considered likely. The major arguments of these opposing viewpoints have been outlined in the CATS Technical Memo, Trends in Average Trip Length by Robert L. Olson. (Author)
PB-177 540 HC$3.00 MF$0.65

THE ROLE OF GROWTH CENTERS IN REGIONAL ECONOMIC DEVELOPMENT.
Iowa State Univ. of Science and Technology, Ames. Dept. of Economics.
For primary bibliographic entry see Field 5C.
PB-177 542 HC$3.00 MF$0.65

THE ROLE OF LOCATIONAL CONTROL IN AN INFORMATION SYSTEM.
East-West Gateway Coordinating Council, East St. Louis, Ill.
Sep 67, 134p*

Descriptors: (*Urban planning, *Information retrieval), Urban areas, Systems engineering, Mapping, Data processing systems, Programming (Computers), Subroutines, Identification, Optical scanning, Missouri.
Identifiers: IBM 1401, St. Louis County (Missouri), Information structuring, Data structuring.

The primary objective of St. Louis County in this study was to develop effectual methods and techniques for creating an automated information system for local governmental operations. Considerable interest has been expressed as to what ways the governmental organizations can effectively and economically continue to meet their planning needs and provide adequate services for complex dynamic communities. This report is designed to illustrate both the logic and basic work procedures involved in the development of locational controls for an automated information system utilizing routine functional activities of St. Louis County.
PB-177 623 HC$3.00 MF$0.65

REPORT OF THE GOVERNOR'S TASK FORCE ON REFUSE DISPOSAL.
Rhode Island Statewide Comprehensive Transportation and Land Use Planning Program, Providence.
Feb 68, 93p*
Prepared in cooperation with Rhode Island Dept. of Health.

Descriptors: (*Sanitary engineering, *Urban areas), Wastes (Sanitary engineering), Disposal, Incinerators, Air pollution, Water pollution, Pyrolysis, Earth-handling equipment, Urban planning, United States Government, Law, Rhode Island.

In a review of disposal methods, the report recommends sanitary landfill and incineration as the only feasible general disposal methods for the communities at this time and that composting, high temperature incineration and other experimental methods be considered as they are proven economical and efficient in the future. The necessity for defining governmental responsibility for refuse disposal is emphasized. Local governments should have the entire legal responsibility for the disposal of all refuse generated within their borders. State government should develop and maintain an area-wide plan for refuse disposal, encourage, and if necessary, enforce regional arrangements, provide technical assistance, and set minimum standards for the location, construction, maintenance and operation of refuse disposal facilities.
PB-177 859 HC$3.00 MF$0.65

DEVELOPMENT OF LONG-RANGE PLANNING PROGRAM,
Muscle Shoals Council of Local Governments, Ala.
Arch R. Winter. Feb 68, 28p
Research supported in part by Department of Housing and Urban Development, Washington, D. C.

Descriptors: (*Urban planning, *Management planning), Advanced planning, Inventory analysis, Roads, Surfaces, Mapping, Civil defense systems, Law, Political science, Buildings, Housing, Construction, Economics, Sewage, Water, Recreation, Costs, Alabama.
Identifiers: Muscle Shoals (Alabama).

This report contains an inventory of existing planning programs and activities within the two-county region, including those of the municipalities, area-wide emergency plans and other urban planning studies that have been made. The inventory includes, in addition to the general activities of each planning organization, a listing of plan elements and implementation measures, such as subdivision regulations and zoning ordinances, which have been prepared or adopted by each of the municipalities. The second section of the report sets out a recommended statement of objectives and policies aimed at fulfilling the unmet planning needs of the region. The final section of the report contains an outline and description of the general character and scope of the elements of the physical planning program that is needed in the two-county region. An analysis of available data provides the basis for a description of the work required for the preparation of each element of the planning work, its estimated cost and time-scheduling.
PB-177 893 HC$3.00 MF$0.65

ELECTRONIC COMPUTER STUDY.
Washington State Dept. of Highways.
For primary bibliographic entry see Field 9B.
PB-177 999 HC$3.00 MF$0.65

DEVELOPMENT PLAN, VANCE COUNTY, N.C.
North Carolina State Dept. of Conservation and Development. Div. of Community Planning.
Jan 68, 49p*
Research supported in part by Dept. of Housing and Urban Development, Washington, D. C.

Descriptors: (*Urban planning, North Carolina), Economics, Industries, Agriculture, Housing, Employment, Tobacco, Education, Commerce, Rural areas, Urban areas, Growth, Population, Public relations, Roads.

Contents: Economic development--industrial development, commercial development, agricultural development; Residential development--areas of development, the form of residential development, housing for low income groups, public housing authorities, mobile homes; Development of Kerr Reservoir; Thoroughfares; Implementation.
PB-178 003 HC$3.00 MF$0.65

TWENTY YEARS HENCE. MARTIN COUNTY, NORTH CAROLINA. LAND AND FACILITIES DEVELOPMENT PLAN PUBLIC IMPROVEMENTS PROGRAM CAPITAL IMPROVEMENT BUDGET.
North Carolina State Dept. of Conservation and Development. Div of Community Planning.
Feb 68, 104p*
Research supported in part by Department of Housing and Urban Development, Washington, D. C.

Descriptors: (*Urban planning, North Carolina), (*Rural areas, *Advanced planning), Industrial plants, Industries, Money, Budgets, Public opinion, Recreation, Transportation, Agriculture, Culture, Forestry, Housing, Commerce, Law, Safety, Public health, Education.
Identifiers: Area planning and development.

This publication contains the last three elements in Martin County's planning program. These elements are a Land and Facilities Development Plan, Public Improvements Program, and a Capital Improvements Budget. Three previously published studies, a Population Study, an Economic Potential Study, and a Land Potential Study of Martin County were used as factual and justifiable material for the three elements in this publication. (Author)
PB-178 005 HC$3.00 MF$0.65

THE ATTRIBUTES OF SUCCESSFUL COMMUNITY ACTION PROGRAMS: ALTERNATIVE ATTRIBUTE CONFIGURATIONS FOR DIFFERENT LEVELS OF ANALYSIS,
Barss, Reitzel and Associates, Inc., Cambridge, Mass.
Lawrence W. Barss. Mar 68, 156p BR-OEO-68-106
Contract OEO-B89-4335

Descriptors: (*Urban planning, Operations research), Sociology, Political science, Questionnaires, Management planning, Analysis, Advanced planning.
Identifiers: Urban planning development.

The major requirements of this research effort were: To determine the attributes of successful community action programs (CAP's); and To test particular hypotheses regarding community action. Governing the analysis is the fact that there is no generally accepted body of social theory which can be used as a research frame.
PB-178 007 HC$3.00 MF$0.65

POPULATION AND ECONOMIC BASE STUDY FLORENCE, SOUTH CAROLINA.
Florence, S. C.
Dec 67, 105p
Availability: Original document in color until exhausted. Prepared in cooperation with Eric Hill Associates, Inc., and Dept. of Housing and Urban Development, Washington, D. C.

Descriptors: (*Urban planning, *Economics), Sociology, Industries, Agriculture, Labor, Manpower studies, Employment, Motivation, Birth, Mortality rates, Statistical data, Advanced planning, Flow charting, South Carolina.
Identifiers: Florence (South Carolina), Graphs (Charts).

An analysis of changes occurring in South Carolina's economy. Relationship of these changes to economic and population trends within the seven-county predominantly agricultural region served by the City of Florence. Analysis of how these

trends have affected manufacturing, transportation and trade in the city and its urban area. Trends in population of the City of Florence and Florence County; distribution and characteristics of population. Estimates of current population size and projections by five-year intervals to 1985.
PB-178 027 HC$3.00 MF$0.65

MACLOG SELF-ANALYSIS.
Metropolitan Atlanta Council of Local Governments, Ga.
Mar 68, 32p
Prepared in cooperation with Housing and Urban Development, Atlanta, Ga.

Descriptors: (*Urban planning, Georgia), Urban areas, Rural areas, Natural resources, Economics, United States Government, Management planning, Scheduling.
Identifiers: Area planning and development.

A study of the relationship existing between MACLOG and Atlanta Region Metropolitan Planning Commission and consideration of changes in the relationship. Alternate legal forms for MACLOG are discussed. Some of the major policy questions facing the region are listed with suggestions as to how MACLOG might address itself to these issues. The function of MACLOG in relation to state government is discussed. (Author)
PB-178 073 HC$3.00 MF$0.65

COMPUTER PROGRAMMING DEVELOPMENT,
California State Div. of Highways. Computer Systems Dept.
W. L. Collins. Feb 68, 15p*
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Descriptors: (*Roads, Systems engineering), (*Computer programs, Roads), Programming languages, Management engineering, Research program administration, Data storage systems, Advanced planning, Site selection, Design, Pavements, Construction, Reinforcing materials, Aerial photography.
Identifiers: Computer aided design, FORTRAN, Cobol, AUTOCODER programming language, SAP programming language.

The study provided a means to develop and implement new improved computer applications in the areas of highway route location, structural design, and aerial photography. The computer applications were developed for the IBM System 360/40, the IBM 704 or the IBM 1401 computers which the California Divisions of Highways operate and use. (BRL abstract)
PB-178 087 HC$3.00 MF$0.65

APPARENT RATE CONSTANTS AND ACTIVATION ENERGIES FOR THE PHOTOCHEMICAL DECOMPOSITION OF VARIOUS OLEFINS,
Clemson Univ., S. C. Dept. of Chemical Engineering.
For primary bibliographic entry see Field 7E.
PB-178 113 HC$3.00 MF$0.65

THE USE OF LIGHTWEIGHT AGGREGATE IN FLEXIBLE PAVEMENTS.
Final rept.,
Texas Highway Dept.
Bob M. Gallaway, and William J. Harper. Aug 67, 40p* RR-51-4-F
Prepared in cooperation with Bureau of Public Roads, Washington, D. C., and Texas Transportation Inst., College Station.

Descriptors: (*Pavements, *Construction materials), Asphalt, Limestone, Shale, Design, Performance (Engineering), Freezing, Permeability, Trafficability, Defects (Materials), Acceptability, Flexible structures, Degradation, Roads.
Identifiers: Aggregates (Materials).

The study was directed toward verifying expected performance and safety aspects of lightweight aggregate when compared to precoated limestone used primarily as coverstone for seal coats. Both laboratory and field studies were carried out to prove that lightweight aggregate is quite suitable as a coverstone for seal coats and surface treatments. Lightweight aggregate was found to cause no 'flying' stone problem and thus damage to windshields and headlamps was eliminated where this material was used. Although not a part of the study, it was found that lightweight synthetic aggregate used as coverstone for seal coats produced a surface of high and prolonged skid resistance. Exploratory research in the laboratory and field with lightweight aggregate in hot-mix asphalt paving mixtures shows great promise for this new source of aggregate. Mixes designed to include as much as fifty percent (by volume) of lightweight aggregate appear entirely suitable for high quality asphalt surface courses. The mixtures are highly stable, are not water susceptible, and above all, produce a non-skid surface. When proper use is made of local materials for the intermediate and fine sized fraction of the mix, designs containing lightweight aggregate compare favorably in cost with designs made from regular aggregates. (Author)
PB-178 120 HC$3.00 MF$0.65

STAUB REINHALTUNG DER LUFT IN ENGLISH, VOL. 27, NO. 10, 1967.
National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.
1967, 40p* SFCSI-HEW (TT-67-51408/10)
Hygiene Effects and Control of Dusts, Fogs, Gases, Vapours, Radioactive Particles. Trans. of Technical articles and patent sections from Staub (West Germany) v27 n10 1967, tr. by D. Ben-Yaakov. The above journal is translated on a regular basis. Available on subscription at $24.00/year.

Descriptors: (*Air pollution, West Germany), Sulfoxides, Dust, Electrostatic precipitation, Meteorological phenomena, Thermal properties, Incinerators, Respirators, Pilot plants, Aerosols, Sampling, Smokes, Measurement, Temperature inversion, Concentration (Chemistry).

Contents: Air pollution control in Munich; Some experiences with a novel experimental plant for dust removal from brown smoke; The characterization of ground inversions within the framework of air pollution control; A numerical relationship between the immission parameters of a collection and those of a subgroup of this collection; Determining the concentration of ultrafine aerosol particles by means of the thermal precipitator; Immission damage caused by hospital waste incineration; 23rd report of the German committee for respirators; Industrial reports; Patent report.
TT-67-51408/10 HC$3.00

13C. Construction Equipment Materials, and Supplies

SHOCK-ABSORBING MATERIALS. REPORT 3. SELECTION OF A SUITABLE LOW-DENSITY CONCRETE FOR BACKPACKING FOR A PROPOSED FIELD TEST.
Technical rept.,
Army Engineer Waterways Experiment Station Vicksburg Miss
G. C. Hoff. Apr 68, 147p Rept no. AEWES-TR-6-763-3
See also AD-654 511.

Descriptors: (*Underground structures, Concrete), (*Concrete, Shock waves), Absorption, Density, Construction materials, Expanded plastics, Rock (Geology), Honeycomb cores, Compressive properties, Ultrasonic properties, Styrene plastics, Hardening, Shock (Mechanics), Shrinkage, Tables, Selection.

The objective of the study was to investigate three insulating concretes being considered for use as a backpacking material to determine their handling, mixing, and placing characteristics, as well as the density variation, plastic shrinkage, aggregate segregation, and rate of hardening occurring in large sections made with each concrete, and to determine the problems that may be associated with the use of these concretes in a prototype situation. Metal, half-scale model sections of a typical rock opening and tunnel liner were used in the study. The annular space of each section was pumped full or partially full of cellular, vermiculite, or polystyrene concrete. Each concrete was evaluated on the basis of ease of handling, batching, and placing and on the density variations occurring in both the unhardened and hardened condition of the concrete. In situ density variations were studied by the use of three techniques: ultrasonic pulse velocity, heat development, and hardened concrete samples. Fresh concrete unit weights were used for the unhardened concrete quality control. Rate-of-hardening tests were conducted to aid in the estimation of form-removal times. Methods of reducing plastic shrinkage and bleeding are discussed, along with other features such as handling and storage requirements of mixture components and suggested prototype batching and placing equipment and techniques. An appendix describes a field placement trial of a cellular concrete arch section to determine the ease of placing and forming, required strength for arch to stand unsupported, and settlement of arch crown. (Author)
AD-669 596 HC$3.00 MF$0.65

STABILITY OF SOME NONLINEAR SYSTEMS,
California Univ Berkeley Structural Engineering Lab
For primary bibliographic entry see Field 12A.
AD-669 630 HC$3.00 MF$0.65

THE USE OF LIGHTWEIGHT AGGREGATE IN FLEXIBLE PAVEMENTS.
Texas Highway Dept.
For primary bibliographic entry see Field 13B.
PB-178 120 HC$3.00 MF$0.65

13D. Containers and Packaging

SILICATE FOAM FOR AIRDROP CUSHIONING.
Rept. for Mar 67-Mar 68,
Southwest Research Inst San Antonio Tex
Jack E. Baker, Jr., and William A. Mallow. May 68, 32p*
USA-NLABS-TR-68-46-AD
Contract DAAG17-67-C-0114

Descriptors: (*Packing materials, *Foams), (*Silicates, Packing materials), Sodium compounds, Substitutes, Mechanical properties, Density, Impact shock, Air drop operations.
Identifiers: Cushioning materials, Sodium silicate.

Sodium silicate foam was proposed as a possible substitute for paper honeycomb as an airdrop cushion. Experimental efforts to implement silicate foam panels using a 2 kilowatt microwave energy source proved inadequate. Larger energy input with a more uniform flux appeared to be necessary to accommodate the size of panels desired. A sodium silicate/perlite aggregate formulation was found to fulfill most of the product specifications. Areas for improvement include collapsed to expanded ratio, maximum strain level, rectangularity of stress-strain curve, product density and friability. The silicate/perlite formulation and foamed sodium silicate formulations allow a wide latitude of variation and control. It is believed that optimization of formulation and heating equipment can be realized. (Author)
AD-669 666 HC$3.00 MF$0.65

FLEXIBLE VACUUM JACKET DEVELOPMENT FINAL REPORT.
Goodyear Aerospace Corp., Akron, Ohio.
22 Jun 67, 167p NASA-CR-94236, GER-13342
Contract NAS8-11376

Descriptors: *Cryogenic fluids, *Jackets, *Liquid filled shells, *Structural design, Flexibility, Insulation, Laminates, Mylar (trademark), Performance tests, Propellant tanks.

For abstract, see STAR 06 12.
N68-22114 HC$3.00 MF$0.65

DEVELOPMENT OF A LIQUID SHROUD CRYOGENIC SUPERCRITICAL PRESSURE STORAGE SYSTEM.
Bendix Corp., Davenport, Iowa.
May 68, 66p NASA-CR-1048, REPT.-3734A-67
Contract NAS9-4634
Coll- 66 P Refs

Descriptors: *Aerospace environments, *Cooling systems, *Cryogenic fluid storage, Coolants, Cryogenics, Fuel cells, Liquid helium, Pressure vessels, Refrigerants, Spacecraft design, Thermal insulation.

For abstract, see STAR 06 12.
N68-22842 HC$3.00 MF$0.65

13E. Couplings, Fittings, Fasteners, and Joints

EVALUATION OF TANTALUM TO STAINLESS STEEL TRANSITION JOINTS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A. C. Spagnuolo. Apr 68, 29p NASA-TM-X-1540

Descriptors: *Soldered joints, *Stainless steels, *Tantalum, *Tensile strength, Brazing, Embrittlement, High pressure, High temperature, Vacuum furnaces.

For abstract, see STAR 06 12.
N68-21898 HC$3.00 MF$0.65

13F. Ground Transportation Equipment

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: INTERNATIONAL HARVESTER CO. 66-0019 TO 67-0123.
National Highway Safety Bureau, Washington, D. C.
15 May 68, 101p*

Descriptors: (*Cargo vehicles, Defects (Materials)), (*Safety, Cargo vehicles), Malfunctions, Quality control, Maintenance, Failure (Mechanics), Vehicle chassis components.
Identifiers: Motor vehicle safety defect recall, Trucks.

The report contains representative copies of notices and other communications to dealers and their customers regarding possible defects in vehicles produced by the subject manufacturer.
PB-177 314 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: FREIGHT-LINER CORPORATION 67-0037 TO 67-0090, HARLEY-DAVIDSON MOTOR CO. 67-0025, KAISER JEEP CORPORATION 67-0002 TO 67-0120, MACK TRUCKS INCORPORATED 67-0036 TO 67-0060, SHELBY AMERICAN INC. 67-0026, SUPERIOR COACH CORPORATION 67-0043, WHITE MOTOR CORPORATION 67-0050 TO 67-0087.
National Highway Safety Bureau, Washington, D. C.
15 May 68, 115p*

Descriptors: (*Cargo vehicles, Defects (Materials)), (*Passenger vehicles, Defects (Materials)), (*Safety, Vehicles), Motorcycles, Tractors, Malfunctions, Quality control, Maintenance, Failure (Mechanics), Vehicle chassis components.
Identifiers: Motor vehicle safety defect recall, Jeeps, Trucks.

The report contains representative copies of notices and other communications to dealers and their customers regarding possible defects in vehicles produced by the subject manufacturers.
PB-177 315 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: AMERICAN HONDA MOTOR CO. 66-0003 TO 66-0034, BAYERISCHE MOTOREN WERKE 67-0012, BRITISH MOTOR HOLDINGS (USA) INC. 66-0028, GM CORP. (FOREIGN DISTR. DIV) 67-0058 TO 67-0061, JAGUAR CARS, INC. 67-0004, LEYLAND MOTOR CORPORATION NORTH AMERICA 67-0114 TO 67-0124.
National Highway Safety Bureau, Washington, D. C.
15 May 68, 79p*

Descriptors: (*Passenger vehicles, Defects (Materials)), (*Safety, Passenger vehicles), Motorcycles, Malfunctions, Quality control, Maintenance, Failure (Mechanics), Vehicle chassis components.
Identifiers: Motor vehicle safety defect recall.

The report contains representative copies of notices and other communications to dealers and their customers regarding possible defects in vehicles produced by the subject manufacturers.
PB-177 316 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: MERCEDES-BENZ OF NORTH AMERICA, INCORPORATED 66-0027 TO 67-0077, NISSAN MOTOR CORP. IN USA 67-0011, PORSCHE OF AMERICA CORP 67-0006.
National Highway Safety Bureau, Washington, D. C.
15 May 68, 75p*

Descriptors: (*Passenger vehicles, Defects (Materials)), (*Safety, Passenger vehicles), Cargo vehicles, Malfunctions, Quality control, Maintenance, Failure (Mechanics), Vehicle chassis components.
Identifiers: Motor vehicle safety defect recall, Trucks.

The report contains representative copies of notices and other communications to dealers and their customers regarding possible defects in vehicles produced by the subject manufacturers.
PB-177 317 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: RENAULT, INCORPORATED 66-0001 TO 67-0020, ROLLS-ROYCE, INCORPORATED 66-005A TO 67-0106, SAAB USA, INCORPORATED 67-0128, CHRYSLER MOTORS CORPORATION (SIMCA ROOTES DIVISION) 67-0078, TOYOTA MOTOR SALES, USA, INC. 67-00059.
National Highway Safety Bureau, Washington, D. C.
15 May 68, 76p*

Descriptors: (*Passenger vehicles, Defects (Materials)), (*Safety, Passenger vehicles), Malfunctions, Quality control, Maintenance, Failure (Mechanics), Vehicle chassis components.
Identifiers: Motor vehicle safety defect recall.

The report contains representative copies of notices and other communications to dealers and their customers regarding possible defects in vehicles produced by the subject manufacturers.
PB-177 318 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: VOLKSWAGEN OF AMERICA, INC. 66-006 TO 67-0129.
National Highway Safety Bureau, Washington, D. C.
15 May 68, 82p*

Descriptors: (*Passenger vehicles, Defects (Materials)), (*Safety, Passenger vehicles), Malfunctions, Quality control, Maintenance, Failure (Mechanics), Vehicle chassis components.
Identifiers: Motor vehicle safety defect recall.

The report contains representative copies of notices and other communications to dealers and their customers regarding possible defects in vehicles produced by the subject manufacturer.
PB-177 319 HC$3.00 MF$0.65

NATIONAL TRAFFIC SAFETY DATA CENTER PROJECT DEFINITION PHASE. VOLUME I,
EBS Management Consultants, Inc., Washington, D. C.
For primary bibliographic entry see Field 5B.
PB-178 183 HC$3.00 MF$0.65

NATIONAL TRAFFIC SAFETY DATA CENTER PROJECT DEFINITION PHASE. VOLUME II,
EBS Management Consultants, Inc., Washington, D. C.
For primary bibliographic entry see Field 5B.
PB-178 184 HC$3.00 MF$0.65

13G. Hydraulic and Pneumatic Equipment

DESIGN AND DEVELOPMENT OF A SERVO-CONTROLLED GAS INBLEED SYSTEM FOR A HIGH VACUUM CALIBRATION CHAMBER.
Arnold Engineering Development Center Arnold Air Force Station Tenn
For primary bibliographic entry see Field 14B.
AD-669 562 HC$3.00 MF$0.65

INDUCER DYNAMICS, PARTIAL FLOW HYDRAULIC TURBINE DRIVE INTERIM REPORT, JUL. 1967 - JAN. 1968.
Rocketdyne, Canoga Park, Calif.
J. A. King. Feb 68, 184p NASA-CR-72379, R-7427
Contract NAS3-10280

Descriptors: *Computerized design, *Intake systems, *Turbomachinery, Equilibrium, Hydraulic equipment, Low speed, Mathematical models.

For abstract, see STAR 06 12.
N68-22094 HC$3.00

STERILIZABLE WIDE ANGLE GAS BEARING GYRO FGG334 S QUARTERLY PROGRESS REPORT, 1 OCT. 1967 - 1 JAN. 1968.
Honeywell, Inc., Minneapolis, Minn. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Aerospace Div.
G. J. Erickson, and R. S. Johnson. 15 Jan 68, 16p NASA-CR-94327, REPT.-20584-QR5
Contracts NAS7-100, JPL-951529
Prep- Prepared for Jpl

Descriptors: *Gyroscopes, *Moisture content, *Venting, Gas bearings, Graphs (charts), Journal bearings, Thrust bearings.

For abstract, see STAR 06 12.
N68-22345 HC$3.00 MF$0.65

STUDIES OF A FLUIDIC OSCILLATOR AS A TEMPERATURE SENSOR,
California Univ., Livermore. Lawrence Radiation Lab.

R. L. Osborne, and D. D. Cooksey. 1 Nov 67, 27p* Contract W-7405-eng-48

Descriptors: (*Fluid amplifiers, *Temperature sensitive elements), Oscillators, Sensors.
Identifiers: Bistable amplifiers.

For abstract, see NSA 22 10.
UCRL-50344 HC$3.00 MF$0.65

13H. Industrial Processes

STRENGTHENING MECHANISMS IN DISPERSION HARDENED NICHROME,
Boeing Co Renton Wash Airplane Div
For primary bibliographic entry see Field 11F.
AD-669 208 HC$3.00 MF$0.65

EQUIPMENT FOR SPARK-ASSISTED MACHINING (OBORUDOVANIE DLYA ELEKTROISKROVOI OBRABOTKI),
Foreign Technology Div Wright-Patterson AFB Ohio
G. Pogodin-Alekseev, B. Mezhuev, and I. Muslimov. 4 Oct 67, 11p Rept no. FTD-HT-23-766-67
Unedited rough draft trans. of Vystavka Dostizhenii Narodnogo Khozyaistva SSR. Informatsionnyi Byulleten, n10 p9-11 1966.

Descriptors: (*Machine tools, *Electroerosive machining), Machine tool industry, Electroforming, Electrodes, Electrolytic capacitors, Electric discharges, Tolerances (Mechanics), Surface roughness, Dies, Molding, Fibers (Synthetic), USSR.
Identifiers: Translations, *Spark assisted machining.

Spark-assisted machining is now being used in industry with striking effectiveness. This success is explained by the fact that the electric-spark method makes it possible to shape complicated molds, dies, spinnerets and other parts from any type of current-conducting material, irrespective of its physicomechanical properties. The saving that results is considerable. Thus, 37 thousand rubles were saved in the tool-making shop of the First Moscow Clock Factory in making 440 hard-alloy dies. Spark-assisted machining is widely used not only in instrument- and machine building, but also in light industry. It is used in the production of decorative products (Persian lamb, Tsigeian sheep, beaver, etc.) from synthetic fibers. This machine is used to make fine-structured screens, filters and various components of instruments and tools by positive and negative duplication. Precision tolerances on the parts range to 0.002 mm, and the machined-surface finish is of class 7-10. The minimum size of the bridges and slots is 0.02 mm. Machining regimes: voltage 0.150 v; short-circuit current less than 1 amp; capacitance of condensers 0.005-0.025 microfurans. Kerosene or distilled water is used as the dielectric liquid. The over-all dimensions of the machine are 880 x 720 x 1300 mm. (Author)
AD-669 311 HC$3.00 MF$0.65

HANDWRITING OF AN INSTITUTE (POCHERK INSTITUTA),
Foreign Technology Div Wright-Patterson AFB Ohio
E. Manucharova. 18 Aug 67, 13p Rept no. FTD-HT-23-839-67
Edited trans. from Izvestiya (USSR) p3 23 Mar 67, by E. Harter.

Descriptors: (*Welding, USSR), Arc welding, Scientific research, Electrical equipment, Slags, Colloids, Pipes.
Identifiers: Translations, Emulsion arc welding.

The document presents a newspaper article in praise of the scientific research successes produced at the Ye. O. Paton Institute of Electrical Welding. The institute is part of the Academy of Sciences, Ukrainian SSR. The institute and its leaders are credited with the ability to forsee national needs and to be able to develop the best of techniques in the field of electrical welding. Specific examples mentioned include new techniques for welding gas pipe-lines, electro-slag welding, and a new process still under study - emulsion arc welding. (Author)
AD-669 315 HC$3.00 MF$0.65

A GENERAL COMPUTER PROGRAM FOR EVALUATION OF TEMPERATURE PROFILES AND INTERFACE POSITION IN FILAMENTS UNDERGOING SOLIDIFICATION.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11E.
AD-669 329 HC$3.00 MF$0.65

HETEROJUNCTION DEVICES.
Syracuse Univ N Y Dept of Electrical Engineering
For primary bibliographic entry see Field 9A.
AD-669 365 HC$3.00 MF$0.65

SUPPRESSING NATURAL OSCILLATIONS IN NONLINEAR COMBINED SYSTEMS (PODAVLENIE AVTOKOLEBANII V NELINEINYKH KOMBINIROVANNYKH SYSTEMAKH),
Foreign Technology Div Wright-Patterson AFB Ohio
V. I. Panov. 8 May 67, 22p Rept no. FTD-MT-24-102-67
Edited machine trans. of Teoriya Invariantnosti v Sistemakh Avtomaticheskogo Upravleniya. Soveshchaniya (2d) Kiev, 1962. Trudy, Moscow, 1964 p255-64.

Descriptors: (*Control systems, Stability), (*Transfer functions, Nonlinear systems), Automation, Invariance, Perturbation theory, Approximation (Mathematics), Damping, Oscillation, USSR.
Identifiers: Translations.

The suppression of auto-oscillations in nonlinear combined systems is investigated. An approximation method is proposed for estimating the effect of connections with respect to perturbation on the stability of nonlinear combined systems (NCS). This approximation method consists of two parts: a determination of the effects of connections with respect to perturbation on the effect of an open control circuit on the stability of the NCS, taking into account the specific nonlinear characteristic of the closed circuit. This article investigates single-circuit, nonlinear systems and those reduced to them, with one nonlinear link. Using the approximation method for determining the effect of connections with respect to perturbation on the stability of the NCS, the author concludes that the parameters of connections can be selected from the conditions of stability. The stability of NCS under different variants of including a connection with respect to perturbation can be determined. The effect of the parameters of links of a closed cycle on stability can also be determined. In addition, it is possible to fulfill the conditions of a given partial of absolute invariance in NCS. The author also points out that, if the nonlinear link of the system has a partial derivative greater than zero, the connections are a means of suppressing auto-oscillations.
AD-669 429 HC$3.00 MF$0.65

RANDOM SEARCH IN OPTIMIZATION PROBLEMS FOR MULTIPARAMETER SYSTEMS,
Foreign Technology Div Wright-Patterson AFB Ohio
L. A. Rastrigin. 1 Aug 67, 263p* Rept no. FTD-HT-67-363
Unedited rough draft trans. of mono. Sluchainyi Poist v Zadachakh Optimizatsii Mnogoparametrichesktikh Sistem, Riga, 1965 p1-211.

Descriptors: (*Automation, USSR), (*Optimization, Systems Engineering), Learning machines, Adaptive systems, Saddle point method, Numerical methods and procedures, Statistical analysis, Logic circuits, Cybernetics, Algorithms.
Identifiers: Translations.

It is only quite recently, roughly from the middle Fifties, that the theory of multiparameter automatic-optimization systems has appeared and received vigorous development. The outstanding characteristic of such systems is the search process, which ensures production of the information required to control the object. The first studies in this area were carried out, and the principal ideas were formulated by Professor A.A. Fel'dbaum in 1956. In recent years, two trends have developed in the field of automatic-optimization system theory; they are characterized by different approaches to the nature of the search process. The first trend considers search as a fully regular process of information collection. Characteristic representatives of this trend are the very familiar Gauss-Seidel, gradient, steepest-descent, and other methods. The second trend originates with the Ashby Homeostat where the search process is random in nature, and the studies of A.G. Ivakhnenko, who demonstrated the importance of the randomness element for system selforganization. The present book is wholly concerned with the development of the latter trend, insofar as it applies to automatic optimization of multiparameter systems.
AD-669 542 HC$3.00 MF$0.65

AGING OF COLDWELD-SEALED QUARTZ CRYSTAL UNITS.
Army Electronics Command Fort Monmouth N J
For primary bibliographic entry see Field 9A.
AD-669 592 HC$3.00 MF$0.65

FORECAST OF NUMERICAL CONTROL TECHNOLOGIES,
Edgewood Arsenal Md
John C. Williams. Apr 68, 16p Rept no. EA-SP-400-12

Descriptors: (*Machine tools, Control systems), (*Machine shop practice, Automation), Digital systems, Machine shop practice, Manufacturing methods, Punched tape, Digital computers, Graphics, Production, Periodicals, Army research, Fluidics.
Identifiers: Numerical control systems, Computer aided design.

A major portion of our defense needs today falls in the general category of small lots and short runs. We need a manufacturing technology that can responsively and economically produce hardware in small lots. It must readily adapt to quick changeover from one short run to the next. Numerical control (N/C) has introduced a new language to manufacturing, a language that permits communications between man and machine tools or between manufacturing concerns. Since N/C equipment is primarily digital controls, then digital data becomes the communications media. Recognizing N/C as digitally-controlled equipment, the idea of an automated job shop controlled by a digital computer is not unique. Consequently, in the ultimate analysis, N/C will no longer exist as a series of separate entities but as a total system under the control of a digital process computer. The initial phase of this investigation has been completed, and advance work is progressing. (Author)
AD-669 598 HC$3.00 MF$0.65

THE ARMY AND NUMERICAL CONTROL: A PROGRESS REPORT,
Edgewood Arsenal Md
Paul A. Longo. Apr 68, 18p Rept no. EA-SP-600-2

Descriptors: (*Machine tools, Control systems), (*Machine shop practice, Automation), Army re-

search, Logistics, Programming languages, Processing, Pyrotechnics, Cartridge cases, Fluidics, Manufacturing methods, Digital systems, Reviews, Time, Periodicals.
Identifiers: Numerical control systems.

The Army Materiel Command launched a 'Coordinated Numerical Control Study for Long Range Plan' in 1964. The main objective was to direct all Army numerical control (N/C) manufacturing effort, to result in the best implementation of symbolic control technology. The initial study phases have been completed, and advance work is progressing. Extensive investigations are planned for FY69 and FY70 to develop fluidic devices for process control mechanisms. Plans have also been developed to study the feasibility of establishing a central N/C pilot-plant facility. This would become the basis for testing new and advanced N/C techniques and systems for all commodity commands of the Army. (Author)
AD-669 599 HC$3.00 MF$0.65

PROPERTIES AND APPLICATIONS OF DISPERSION-STRENGTHENED METALS.
Monograph series,
Army Materials Research Agency Watertown Mass
Stanley M. Wolf. Jun 67, 23p Rept no. AMRA-MS-67-07

Descriptors: (*Dispersion hardening, Metals), (*Nickel alloys, Dispersion hardening), (*Aluminum alloys, Dispersion hardening), Manufacturing methods, Nickel, Copper alloys, Refractory metal alloys, Powder metallurgy, Mechanical properties, Heat-resistant metals + alloys, Alloys.
Identifiers: Nickel TD (Ni-2ThO2).

Dispersion-strengthened metals offer potential usefulness at temperatures up to ninety percent of their melting temperatures because of their outstanding mechanical stability at elevated temperatures. In addition, most physical and chemical properties are relatively unaffected by the presence of an inert dispersion. Thus, design engineers may be able to select the base metal alloy for properties other than its strength and then incorporate a dispersion in it to obtain the required strength. At present, dispersion-strengthened alloys of aluminum, copper, nickel, and tungsten are commercially available, and alloys of several other refractory, ferrous, and nonferrous metals are being developed. The metallurgical and design characteristics of these alloys are reviewed in this paper. (Author)
AD-669 615 HC$3.00 MF$0.65

DEFORMATION PROCESSING OF PRECIPITATION- HARDENING STAINLESS STEELS.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
F. W. Boulger, A. F. Gerds, and D. E. Strohecker. 1968, 278p NASA-SP-5088, RSIC-495
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Sci. Inform. Center Date-)1968 o Coll- 278 P Refs Prep- Prepared By Battelle Mem. Inst. for Army Missile Command

Descriptors: *Austenitic stainless steels, *Martensitic stainless steels, *Precipitation hardening, Brakes (forming or bending), Extruding, Forging, Hammers, Machine tools, Pressing (forming), Sizing (shaping), Stretching, Tempering.

For abstract, see STAR 06 12.
N68-21917 HC$3.00 MF$0.65

BASIC PRINCIPLES, METHODS, AND OBJECTIVES OF RELIABILITY OPERATIONS.
Scripta Technica, Inc., Washington, D. C.
For primary bibliographic entry see Field 14D.
For abstract, see STAR 06 12.
N68-22348 HC$3.00 MF$0.65

HAND-HELD ELECTRON BEAM GUN AND EXTERNAL POWER SUPPLY FINAL REPORT, JUN. 1965 - OCT. 1966.
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
G. S. Lawrence, and F. R. Schollhammer. Oct 66, 61p NASA-CR-62059, EBR-199
Contract NAS9-4501

Descriptors: *Aerospace environments, *Electron beam welding, *Space tools, Breadboard models, Electron guns, Environmental tests, Fabrication, Space maintenance, Systems engineering, Weld tests, Welded joints.

For abstract, see STAR 06 12.
N68-22611 HC$3.00 MF$0.65

METHOD OF BRAZING ALUMINUM TO STAINLESS STEEL FOR HIGH-STRESS-FATIGUE APPLICATIONS.
National Aeronautics and Space Administration, Washington, D. C.
D. C. Martin. 1968, 16p NASA-SP-5040
Prep- Prepared By Battelle Memorial Inst.

Descriptors: *Aluminum, *Brazing, *Metal joints, *Stainless steels, *Titanium alloys, Intermetallics, Iron alloys, Joining, Protective coatings, Silicon.

For abstract, see STAR 06 12.
N68-22778 HC$3.00 MF$0.65

3-A ACCEPTED PRACTICES FOR THE SANITARY CONSTRUCTION, INSTALLATION, TESTING AND OPERATION OF HIGH-TEMPERATURE SHORT-TIME PASTEURIZERS, REVISED.
International Association of Milk, Food and Environmental Sanitarians, Shelbyville, Ind.
For primary bibliographic entry see Field 6H.
PB-177 437 HC$3.00 MF$0.65

REPORT ON GAS-CUTTING AND WELDING EQUIPMENT.
Adams-Boston Co. Ltd., Tokyo (Japan).
18 Aug 67, 84p*
Prepared in cooperation with Business and Defense Services Administration, Washington, D. C.

Descriptors: (*Economics, Japan), (*Welding, *Commerce), Electron beam welding, Inert gas welding, Ultrasonic welding, Plasma jets, Carbon dioxide, Welding rods, Wire, Arc welding, Resistance welding, Automation, Cutting, Alkynes, Oxygen, Non-destructive testing, Costs.
Identifiers: Market surveys.

The document covers recent developments in the Japanese welding industry, noting methods, materials, and economic aspects.
PB-177 845 HC$3.00 MF$0.65

GLOSSARY OF TECHNICAL TERMINOLOGY (FRENCH, ARABIC, CHINESE) FOR USE WITH PLANT REQUIREMENT REPORT SERIES.
Educational Services, Washington, D. C.
1968, 82p

Descriptors: (*Dictionaries, *Industrial production), Manufacturing methods, Processing, Chinese language, English language.
Identifiers: French language, Arabic language.
PB-177 917 HC$3.00 MF$0.65

PLANT REQUIREMENTS FOR MANUFACTURE OF PHARMACEUTICAL PRODUCTS.
International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Sep 61, 50p

Descriptors: (*Management planning, *Pharmacology), (*Manufacturing methods, *Instruction manuals), Budgets, Safety, Costs, Money, Personnel, Training, Law, Site selection, Production, Manpower, Economics, Machines.

The purpose of this report is to present basic information for establishing a plant in a foreign country to produce pharmaceutical products. The term pharmaceutical products includes tablets; pills, coated and uncoated; and capsules. (Author)
PB-178 062 HC$3.00 MF$0.65

A STATE OF THE ARTS SURVEY AND A STUDY OF THE FEASIBILITY OF RESEARCH IN THE AREA OF NEEDLE HEATING DURING HIGH SPEED SEWING.
North Carolina State Univ., Raleigh. Dept. of Textile Technology.
For primary bibliographic entry see Field 11E.
PB-178 195 HC$3.00 MF$0.65

13I. Machinery and Tools

THE TESTING OF CABLES, WIRES, STRAPS, ETC. (ISPYTANIYA TROSSOV, PROVOLOK, LENT I PR.).
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 14B.
AD-669 162 HC$3.00 MF$0.65

NEW POLYMERIC MATERIALS IN ANTICORROSION TECHNOLOGY (NOVYE POLIMERNYE MATERIALY V ANTIKORROZIONNOI TEKHNIKE),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11I.
AD-669 518 HC$3.00 MF$0.65

EXPERIMENTS ON STABILITY OF HERRINGBONE GROOVED GAS-LUBRICATED JOURNAL BEARINGS TO HIGH COMPRESSIBILITY NUMBERS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
W. J. Anderson, R. E. Cunningham, and D. P. Fleming. Apr 68, 21p NASA-TN-D-4440
Contract 129-03-13-05-22

Descriptors: *Gas lubricants, *Grooves, *Journal bearings, *Rotary stability, Clearances, Compressibility, Sleeves, Spacing, Spin tests, Tolerances (mechanics).

For abstract, see STAR 06 12.
N68-21965 HC$3.00 MF$0.65

THE PROBLEM OF THE THEORY OF OPERATION OF PLOW SHARES,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 8M.
PB-176 836T HC$3.00 MF$0.65

TABLE OF GEAR RATIOS, 36.0000 TO 5.1449,
Sandia Corp., Albuquerque, N. Mex.
Robert L. Lachance, and Ralph M. Rayner. Mar 68, 174p*

Descriptors: (*Filament-wound construction, Gears), (*Gears, Tables).
Identifiers: Gear ratios.

For abstract, see NSA 22 10.
SC-M-68-63 HC$3.00 MF$0.65

13J. Marine Engineering

UNSTEADY FORCE MEASUREMENTS ON FULLY WETTED HYDROFOILS IN HEAVING MOTION,
California Inst of Tech Pasadena
G. J. Klose, and A. J. Acosta. 28 Jun 67, 12p
Contract N00014-67-A-0094

Availability: Published in Journal of Ship Research, v12 n1 p69-80 Mar 1968.

Descriptors: (*Hydrofoils, Force (Mechanics)), Motion, Aspect ratio, Two-dimensional flow, Frequency, Angle of attack, Wedges, Hydrodynamics.
Identifiers: Heave (Motion).

An experimental investigation is reported of the unsteady forces due to heaving motion of fully wetted hydrofoils of unity aspect ratio and also in two-dimensional flow. The tests covered a broad range of reduced frequency and determined the effects of variation in submergence depth, angle of attack, oscillation amplitude, and flow velocity. In general, the findings agree well with available theoretical calculations, but some unexpected variations were found for the case of a wedge-shaped foil and for changes in angle of attack. (Author)
AD-669 289 Not available from CFSTI.

THEORY CALCULATION AND DESIGN OF SUPERCAVITATING PROPELLER.
Final rept. 1 Apr 67-31 Mar 68,
Bureau D'Analyse Et de Recherche Appliquees Boulogne-Billancourt (France)
L. Malavard. 31 Mar 68, 27p
Contract F61052-67-C-0107

Descriptors: (*Propellers (Marine), *Cavitation), Design, Lift, Drag, Load distribution, Propeller blades, Analog systems, Models (Simulations), Theory, Simulation, France.
Identifiers: Supercavitating propellers, Rheoelectric simulation.

The report contains the theory calculation and design of supercavitating propeller by the method of the rheo-electric analogy. (Author)
AD-669 363 HC$3.00 MF$0.65

MOORING MOTION,
Woods Hole Oceanographic Institution Mass
N. P. Fofonoff, and John Garrett. May 68, 32p
Rept no. WHOI-Ref-68-31
Contracts Nonr-3351 (00), Nonr-2196 (00)

Descriptors: (*Mooring buoys, Motion), (*Ocean currents, Mooring buoys), Response, Velocity, Measurement, Drag, Tracking telescopes, Surface properties, Floats, Deep water, Mathematical models, Density, Sea water, Bermuda.

A study of the horizontal displacement of moored buoys in response to currents. A simple theoretical model is used to interpret measured displacements of moorings set near Bermuda. (Author)
AD-669 456 HC$3.00 MF$0.65

CURRENT MEASUREMENTS FROM MOORED BUOYS, 1959-1965.
Woods Hole Oceanographic Institution Mass
For primary bibliographic entry see Field 8C.
AD-669 457 HC$3.00 MF$0.65

TURBULENT BOUNDARY LAYER CHARACTERISTICS OVER A ROUGH SURFACE IN AN ADVERSE PRESSURE GRADIENT.
Naval Ship Research and Development Center Washington D C Hydromechanics Lab
For primary bibliographic entry see Field 20D.
AD-669 486 HC$3.00 MF$0.65

STUDY OF WORK-PRODUCING CHARACTERISTICS OF UNDERWATER OPERATIONS.
North American Rockwell Corp Downey Calif Space Div
For primary bibliographic entry see Field 5J.
AD-669 512 HC$3.00 MF$0.65

DETERMINATION OF WEIGHT, VOLUME AND COST FOR TANKERS AND DRY CARGO SHIPS,
Rand Corp Santa Monica Calif
Roger P. Johnson, and Henry P. Rumble. Apr 68, 167p* Rept no. RM-3318-1-PR
Contract F44620-67-C-0045

Descriptors: (*Tankers, Costs), (*Cargo ships, Costs), Mathematical prediction, Weight, Volume, Design, Manpower studies.
Identifiers: Cost estimating.

A description is given of a method for obtaining design characteristics, weight, volume, and cost of various sizes of tankers and dry-cargo ships. Details of component weight, volume, and cost of a number of ships, estimated in accordance with usual shipbuilding practice, were analyzed and the data are plotted in parametric form as working charts. These charts show the relationships of component weight, volume, material cost, and manhours for the respective Navy weight and cost groups. The accuracy of the weight, volume, and cost-estimating techniques is within plus or minus 10 percent except for unusual circumstances. Substantiating data for the working charts (that is, the data points and the rationale for determination of the parametric relationships) are presented. (Author)
AD-669 568 HC$3.00 MF$0.65

SHIP WAVES AT RECREATIONAL BEACHES,
California Univ Berkeley Hydraulic Engineering Lab
For primary bibliographic entry see Field 20D.
AD-669 585 HC$3.00 MF$0.65

STATE OF ART AND DEVELOPMENT OF VESSEL POWER INSTALLATIONS ABROAD (SOSTOYANIE I RAZVITIE KORABELNYKH ENERGETISCHESKIKH USTANOVOK ZA RUBEZHOM),
Naval Ship Systems Command Washington D C
V. P. Pozdnyakov. Feb 68, 22p Rept no. NAVSHIPS Trans-1059
Trans. of Sudostroenie (USSR) v57 n1 p34-45 1967, by Lloyd G. Robbins.

Descriptors: (*Diesel engines, State-of-the-art reviews), (*Marine engines, Diesel engines), Naval vessels (Combatant), Naval vessels (Support), Marine surface propulsion, Design, Frigates, Aircraft carriers, Gas turbines, Ship turbines, Performance (Engineering), USSR.
Identifiers: Foreign naval vessels, Translations.

The combined power of the main diesels suitable for utilization as sources of cruising power and already installed in the cruising ships or those under construction, attains 8,000 hp, but in most instances equals 2000-4500 hp. In this context, the aggregate power of the multipurpose diesels, for which the area of application in the navies is continually expanding, does not exceed 3500 hp. The aggregate power of the light-duty highly-supercharged diesels, mounted in the combat launches, constitutes 3000-3600 hp. (Author)
AD-669 602 HC$3.00 MF$0.65

INTEGRATED MARINE STEAM TURBINE PROPULSION PLANT.
Combustion Engineering, Inc., New York.
Sep 62, 233p*
Prepared in cooperation with Allis-Chalmers Mfg. Co., and J. J. Henry Co., Inc. Research supported by Maritime Administration, Contract MA-2803.

Descriptors: (*Steam turbines, *Ship turbines), (*Marine engines, Integrated systems), Marine propulsion, Merchant vessels, Performance (Engineering), Specifications, Design, Operation, Boilers, Instrumentation, Reliability, Maintenance, Manpower, Costs, Mechanical drawings.
Identifiers: Integrated marine steam turbines, PD 108.

Contents: General concept of the integrated steam plant; Description of the finally evolved plant; Component preliminary performance characteristics; Operating principles and sequence; Research history and unique features; Possible design variations; Reliability, maintenance and manning; Cost presentation; Preliminary machinery arrangement drawings for MARAD design PD108; End results required of a computer simulation of the power plant operation.
PB-177 848 HC$3.00 MF$0.65

TECHNICAL, OPERATIONAL AND ECONOMIC REPORT ON THE N. S. SAVANNAH SECOND YEAR OF EXPERIMENTAL COMMERCIAL OPERATION, AUGUST 1966-AUGUST 1967.
Maritime Administration, Washington, D. C. Office of Research and Development.
Aug 67, 66p* NSS/ECO-B

Descriptors: (*Cargo ships, *Nuclear powered vessels), Merchant vessels, Operation, Economics, Marine nuclear propulsion, Performance (Engineering), Scheduling, Efficiency, Shipping (Marine), Training, Health physics, Engineering personnel.
Identifiers: Savannah nuclear cargo ship.

Although the N. S. SAVANNAH was not designed as an optimized cargoliner, but to demonstrate one of the peaceful uses of the atom and as test bed for the application of nuclear power for merchant ship propulsion, the N. S. SAVANNAH has compiled an outstanding record in her first two years of commercial service. Even with inherent design limitations for commercial service, experimental commercial operation of N. S. SAVANNAH reduces the cost of demonstration operations to the Government by an estimated $4,000,000 annually, and at the same time permits a continuation of her valuable research and development functions. The N. S. SAVANNAH has been operating in regularly scheduled cargoliner service efficiently, reliably, and on schedule for two years. (Author)
PB-178 167 HC$3.00 MF$0.65

MODULAR DESIGN APPLICATIONS STUDY (DECKHOUSE AND OUTFIT).
Henry (J. J.) Co., Inc., New York.
1967, 86p* Rept. no. 5475
Contract MA-4358
See also Appendix to above report, PB-178 197.

Descriptors: (*Merchant vessels, Construction), (*Ship decks, Design), Experimental design, Construction materials, Structural parts, Cost effectiveness, Hulls (Marine), Marine engineering, Shipyards, Production control, Manufacturing methods, United States Government.
Identifiers: Modular design.

The study presented here shows that by mass producing deckhouses at a properly laid out and equipped location and by using the proposed simplified design, the total cost per ship on a five ship contract can be reduced by $258,300. In a five ship program this results from a 16.4% saving on the cost of deckhouses, however in a program requiring as many as 20 deckhouses, this benefit could be increased to 25.5%. In order to realize these savings, special facilities costing about $800,000 are required. The key features of such a modular construction program that make the concept feasible and economical are: (1) ideal working facilities without interference and overlapping of trades; (2) pre-assembly of many repetitious items; (3) simplification of construction; (4) mass production, and (5) the vertical configuration of the modules. This report concludes with recommendations as to future studies which may produce further cost savings. By such means the competitiveness of the U.S. Merchant Marine can be increased and the cost of the U.S. Government in the form of subsidies may be reduced. (Author)
PB-178 196 HC$3.00 MF$0.65

Group 13J—Marine engineering

APPENDIX. MODULAR DESIGN APPLICATIONS STUDY (DECKHOUSE AND OUTFIT).
Henry (J. J.) Co., Inc., New York
1967, 75p*
Contract MA-4358
See also basic report, PB-178 196.

Descriptors: (*Merchant vessels, Construction), (*Ship decks, Design), Experimental design, Construction materials, Structural parts, Cost effectiveness, Hulls (Marine), Marine engineering, Shipyards, Production control, Manufacturing methods, United States Government.
Identifiers: Modular design.

This appendix contains the basic material developed prior to the actual final design presented in the report. As described in the report, the ship represented by MA Design No. C5-S-75a was the basic ship to be considered. The house on this ship was modified to reflect the decrease in crew size and the elimination of passengers. Based on this design, which is more complicated and costly than the final design selected, the various piping systems and air conditioning systems were studied in details. Plan nos. 5475-1 through 4 were studied in detail. Plan nos. 5475-5 through 13 represent this detail study. During the preparation of these plans the basic concepts of design features for modular construction were developed and tested for ease of construction. These same principles were applied to the design finally selected. (Author)
PB-178 197 HC$3.00 MF$0.65

13K. Pumps, Filters, Pipes, Fittings, Tubing, and Valves

350-GPM, OPTIMUM LIGHTWEIGHT FILTER/SEPARATOR.
Rept. for Dec 65-Oct 66,
Army Mobility Equipment Research and Development Center Fort Belvoir Va
George A. Gariepy, and Edward C. Russell. Apr 68, 42p* Rept no. USAMERDC-1927

Descriptors: (*Fuel filters, Design), Military requirements, Specifications, Fuel contamination, Water, Iron oxides, Kerosene, Weight, Pressure, Maintenance, Reliability, Hoses, Photographs.

This report covers design, development, engineering design test, and evaluation of a 350-gpm, optimum, lightweight filter/separator for primary application with the military Fuel System Supply Point and the 4-Inch Liquid Fuels Hoseline System. These units were subjected to the comprehensive evaluations necessary to determine conformance to the water- and solids-removal performance requirements of MIL Spec MIL-F-8901A. In addition, rail-impact and rough-handling tests were conducted. (Author)
AD-669 613 HC$3.00 MF$0.65

ANALYTICAL AND EXPERIMENTAL STUDY OF DYNAMIC CHARACTERISTICS OF TURBOPUMPS.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
H. Ohashi. Apr 68, 115p NASA-TN-D-4298

Descriptors: *Airfoils, *Flow equations, *Turbine pumps, Centrifugal pumps, Dynamic response, Flow geometry, Linearity, Pressure gradients, Two dimensional flow.

For abstract, see STAR 06 12.
N68-21950 HC$3.00 MF$0.65

13L. Safety Engineering

SAFETY: AMC SAFETY MANUAL.
Army Materiel Command Washington D C
Jun 64, 975p Rept no. AMC-Regulation-385-224
Formerly ORD-M7-224. Contains changes 11 and 12.
Availability: Hard copy available from Commanding General, U. S. Army Materiel Command, Washington, D. C. Attn: AMC-AD-PP.

Descriptors: (*Safety, Instruction manuals), (*Ordnance, Safety), Handbooks, Explosive materials, Ammunition, Electrical equipment, Lightning, Protective clothing, Fire safety, Rockets, Guided missiles, Hazards, Transportation, Handling.

This manual, in its several sections, sets forth established Ordnance Corps safety rules and regulations. Information concerning the hazards of explosives and ammunition is also included. The safety rules and regulations set forth in this manual prescribe safe methods and practices for insuring continuity of production, safeguarding personnel, and preventing property damage.
AD-669 253 MF$0.65

SPECIALIZED EVALUATIONS OF SHELTER EQUIPMENT AND PROCEDURES.
General American Transportation Corp Niles Ill
General American Research Div
For primary bibliographic entry see Field 15C.
AD-669 258 HC$3.00 MF$0.65

FIBERCELL OVERHEAT HAZARD DETECTION SYSTEM.
Whittaker Corp San Diego Calif Narmco Research and Development Div
For primary bibliographic entry see Field 1D.
AD-669 382 HC$3.00 MF$0.65

EXPERIMENT OF DAMAGE CONTROL MATERIALS AND METHODS FOR FLEET HANDLING OF PACKAGED LIQUID PROPELLANTS.
Allied Chemical Corp Morristown N J Industrial Chemicals Div
For primary bibliographic entry see Field 21I.
AD-669 437 HC$3.00 MF$0.65

SHIP WAVES AT RECREATIONAL BEACHES,
California Univ Berkeley Hydraulic Engineering Lab
For primary bibliographic entry see Field 20D.
AD-669 585 HC$3.00 MF$0.65

THE EVACUATION OF INJURED IN LARGE-SCALE NATURAL AND OTHER DISASTERS,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 6E.
JPRS-44147 HC$3.00 MF$0.65

CHEMICALLY INDUCED IGNITION IN AIRCRAFT AND SPACECRAFT ELECTRICAL CIRCUITRY BY GLYCOL/WATER SOLUTIONS.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
W. R. Downs. Apr 68, 17p NASA-TN-D-4327
Contract 914-50-20-21-72

Descriptors: *Chemical reactions, *Electric wire, *Electrical insulation, *Flammability, *Glycols, Apollo spacecraft, Chelates, Copper, Gas explosions, Silver.

For abstract, see STAR 06 12.
N68-22213 HC$3.00

THE OAK RIDGE RESEARCH REACTOR SAFETY ANALYSIS,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18M.
For abstract, see NSA 22 10.
ORNL-4169-Vol-2 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: INTERNATIONAL HARVESTER CO. 66-0019 TO 67-0123.
National Highway Safety Bureau, Washington, D. C.
For primary bibliographic entry see Field 13F.
PB-177 314 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: FREIGHT-LINER CORPORATION 67-0037 TO 67-0090, HARLEY-DAVIDSON MOTOR CO. 67-0025, KAISER JEEP CORPORATION 67-0002 TO 67-0120, MACK TRUCKS INCORPORATED 67-0036 TO 67-0060, SHELBY AMERICAN INC. 67-0026, SUPERIOR COACH CORPORATION 67-0043, WHITE MOTOR CORPORATION 67-0050 TO 67-0087.
National Highway Safety Bureau, Washington, D. C.
For primary bibliographic entry see Field 13F.
PB-177 315 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: AMERICAN HONDA MOTOR CO. 66-0003 TO 66-0034, BAYERISCHE MOTOREN WERKE 67-0012, BRITISH MOTOR HOLDINGS (USA) INC. 66-0028, GM CORP. (FOREIGN DISTR. DIV) 67-0058 TO 67-0061, JAGUAR CARS, INC. 67-0004, LEYLAND MOTOR CORPORATION NORTH AMERICA 67-0114 TO 67-0124.
National Highway Safety Bureau, Washington, D. C.
For primary bibliographic entry see Field 13F.
PB-177 316 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: MERCEDES-BENZ OF NORTH AMERICA, INCORPORATED 66-0027 TO 67-0077, NISSAN MOTOR CORP. IN USA 67-0011, PORSCHE OF AMERICA CORP 67-0006.
National Highway Safety Bureau, Washington, D. C.
For primary bibliographic entry see Field 13F.
PB-177 317 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: RENAULT, INCORPORATED 66-0001 TO 67-0020, ROLLS-ROYCE, INCORPORATED 66-005A TO 67-0106, SAAB USA, INCORPORATED 67-0128, CHRYSLER MOTORS CORPORATION (SIMCA ROOTES DIVISION) 67-0078, TOYOTA MOTOR SALES, USA, INC. 67-00059.
National Highway Safety Bureau, Washington, D. C.
For primary bibliographic entry see Field 13F.
PB-177 318 HC$3.00 MF$0.65

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS FROM SEPTEMBER 9, 1966 TO DECEMBER 31, 1967: VOLKSWAGEN OF AMERICA, INC. 66-006 TO 67-0129.
National Highway Safety Bureau, Washington, D. C.
For primary bibliographic entry see Field 13F.
PB-177 319 HC$3.00 MF$0.65

ACCIDENT AND VIOLATION PATTERNS OF DRIVERS WITH CHRONIC MEDICAL CONDITIONS,
California State Dept. of Public Health. Bureau of Occupational Health.
Julian A. Waller, and James T. Goo. Jan 67, 36p*
Prepared in cooperation with Bureau of Public Roads, Washington, D. C., and California Univ., Berkeley. Lawrence Radiation Lab.

Descriptors: (*Motor vehicle accidents, Statistical analysis), (*Motor vehicle operators, Diseases), Addiction, Alcohols, Attention, Aging (Physiology), Perception (Psychology), Epilepsy, Cardiovascular diseases, Abnormal psychology, Narcotics, Mental disorders, Diabetes.

Types of accidents and violations were compared for 1701 drivers with chronic medical conditions known to the California Department of Motor Vehicles and 921 drivers not known to have medical conditions. Drivers without medical conditions were found to be innocent in about 1/2 of their accidents, whereas those with alcoholism were innocent in only 13 percent and drivers with other medical conditions in 1/3 of their accidents. A greatest proportion of the accidents of drivers with medical conditions involve leaving or running off the road, momentary inattention, collision of a single vehicle only, or collision with a parked or stopped car. Drivers with greater severity of illness, or who were obviously impaired at the time of the accident had more accidents attributed to weaving or running off the road or involving a single vehicle or parked car, whereas those with mild illness have a greater proportion attributed to inattention. Drivers under age 30 have a greater proportion of accidents related to risk-taking activity, such as excessive speed for conditions and following too closely, whereas drivers age 60 or older had a greater proportion of driving incidents suggestive of inability to perceive, properly judge, or adequately respond to traffic flow, for example, incidents involving failure to observe a traffic signal or right of way. Drivers with epilepsy who always had aura, petit mal seizures, or nocturnal seizures had fewer accidents per million miles than did drivers who occasionally or never had aura or nocturnal seizures, or who had grand mal seizures. However, the samples were small, and the observed differences were not statistically significant. (Author)
PB-177 666 HC$3.00 MF$0.65

NATIONAL TRAFFIC SAFETY DATA CENTER PROJECT DEFINITION PHASE. VOLUME I,
EBS Management Consultants, Inc., Washington, D. C.
For primary bibliographic entry see Field 5B.
PB-178 183 HC$3.00 MF$0.65

NATIONAL TRAFFIC SAFETY DATA CENTER PROJECT DEFINITION PHASE. VOLUME II,
EBS Management Consultants, Inc., Washington, D. C.
For primary bibliographic entry see Field 5B.
PB-178 184 HC$3.00 MF$0.65

13M. Structural Engineering

STRUCTURE AND FOUNDATION BEHAVIOR DURING ANTENNA OPERATION, TAA-2A VERO BEACH, FLORIDA, AND TAA-3 MERRITT ISLAND, FLORIDA,
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 8M.
AD-669 239 HC$3.00 MF$0.65

ANALYSIS OF PIN-JOINTED SPACE FRAMEWORKS: NONLINEAR EFFECTS.
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
K. H. Griffin. Sep 66, 21p
AFIT-TR-66-16

Descriptors: (*Structures, Structural properties), Joints, Structural parts, Deflection, Loading (Mechanics), Thermal stresses, Nonlinear systems, Strain (Mechanics), Elasticity, Stability, Matrix algebra.
Identifiers: *Space frameworks.

Structural analysis of pin-jointed frameworks with large deflections is carried out by postulating 'fictitious forces' and 'fictitious thermal strains' depending on the joint deflections and member loads. These fictitious quantities are added to the actual applied forces and thermal strains to obtain a corrected solution. The first part of this report discusses the analysis of space frameworks in the manner of conventional matrix structural analysis. The second part considers the general nonlinear behavior of such structures using a virtual displacements approach and by retaining the second order quantities justifies the use of fictitious forces and strains. The equations of elastic stability are also derived. (Author)
AD-669 333 HC$3.00 MF$0.65

STUDIES OF THE NAVAL FACILITIES ENGINEERING COMMAND PROTECTIVE SHELTER. II. SUMMER TRIALS.
Final rept.,
Naval Research Lab Washington D C
H. F. Bogardus. 29 Mar 68, 170p Rept no. NRL-6656

Descriptors: (*Fallout shelters, Protection), (*Confined environments, Tolerances (Physiology)), Design, Blast, Radiological contamination, Biological warfare agents, Chemical warfare agents, Military facilities, Military personnel, Radiological contamination, Bacteria, Test facilities, Nutrition, Construction, Environmental tests, Radiation monitors, Military rations, Military medicine.
Identifiers: Summer (Season), Winter (Season).

A 2-week summer trial was conducted at Bethesda, Maryland, during August 1962, in a protective shelter (blast, radioactive fallout, and biological and chemical warfare) designed by the Bureau of Yards and Docks, now Naval Facilities Engineering Command. Navy volunteers served as the shelter subjects. Two naval officers served as shelter commander and medical officer. Since the primary purpose of this trial was to study the engineering features of the shelter, it was considered desirable to conduct the trial with a carefully selected, reasonably homogeneous group of shelterees. Therefore, the shelterees, selected from a group of volunteers, were screened both medically and psychologically. (Author)
AD-669 448 HC$3.00 MF$0.65

VIBRATIONS OF CURVED BEAMS.
Final rept. (Part 2),
North Carolina State Univ Raleigh Dept of Mechanical and Aerospace Engineering
Larry Herbert Royster. May 68, 47p
Contract Nonr-486 (11)
See also Final Report, AD-666 321.

Descriptors: (*Beams (Structural), *Vibration), Curved profiles, Reviews, Rings, Boundary value problems, Dynamics, Deformation, Potential energy, Kinetic energy, Sources.

A review of the literature pertaining to the free and forced vibrations of curved beams is presented herein. The literature is partitioned into two categories; namely, (1) Vibrations in the Plane of Initial Curvature, and (2) Vibrations out of the Plane of Initial Curvature. Representative results of various investigations are presented, and comparisons are noted between the theoretical and experimental data wherever possible. (Author)
AD-669 493 HC$3.00 MF$0.65

FREE VIBRATIONS OF RING-AND-STRINGER-STIFFENED CONICAL SHELLS.
Houston Univ Tex Dept of Mechanical Engineering
For primary bibliographic entry see Field 20K.
AD-669 499 HC$3.00 MF$0.65

ON THE DEVELOPMENT OF THE THEORY OF THIN WALLED CONSTRUCTIONS IN ESTONIAN SSR (O RAZVITII TEORII TONKOSTENNYKH KONSTRUKTSII V ESTONSKOI SSR),
Foreign Technology Div Wright-Patterson AFB Ohio
Kh. Laul. 22 Aug 67, 22p Rept no. FTD-HT-66-571
Unedited rough draft trans. of Akademiya Nauk Estonskoi SSR, Tallinn. Izvestiya. Seriya Fiziko-Matematicheskikh i Tekhnicheskikh Nauk n3 p319-27 1965, by S. Marokus.

Descriptors: (*Structural shells, USSR), Structural properties, Elastic shells, Sheets, Metal plates, Curved profiles, Walls, Panels (Structural), Stability, Flexible structures, Design, Deformation, Loading (Mechanics), Plasticity, Oscillation, Vibration, Stresses, Deflection, Bibliographies.
Identifiers: Estonia (USSR), Translations.

The development of the theory and design of thin-walled structures started in the Estonian SSR in 1945, after the war, and is associated with the name of N. Alumyae. The review is divided into three sections: (1) Theory of elastic and plastic stability and equilibrium of shells and plates; accuracy analysis of the theory. (2) Dynamics of shells and plates; accuracy analysis of engineering theories in plate and shell dynamics. (3) Experimental studies of plate and shell strength under static loads. A brief account of developments in all these aspects of the field of shell and plate design is presented by combining short critical annotations on a majority of 88 items of a list of publications by Estonian authors. (Author)
AD-669 519 HC$3.00 MF$0.65

SHOCK-ABSORBING MATERIALS. REPORT 3. SELECTION OF A SUITABLE LOW-DENSITY CONCRETE FOR BACKPACKING FOR A PROPOSED FIELD TEST.
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 13C.
AD-669 596 HC$3.00 MF$0.65

INJECTION WELL, EARTHQUAKE RELATIONSHIP ROCKY MOUNTAIN ARSENAL, DENVER, COLORADO.
Army Engineer District Omaha Nebr
For primary bibliographic entry see Field 13B.
AD-669 600 HC$3.00 MF$0.65

STATIC TESTS OF REINFORCED CONCRETE BEAMS. REPORT 1. DEVELOPMENT OF ITERATIVE ANALYSIS PROCEDURE AND TESTS OF BEAMS REINFORCED WITH STEEL ALUMINUM, AND FIBER GLASS, WITH AND WITHOUT HELICAL COMPRESSIVE REINFORCEMENT.
Technical rept.,
Army Engineer Waterways Experiment Station Vicksburg Miss
H. G. Geymayer. Mar 68, 119p Rept no. AEWES-TR-6-818-1

Descriptors: (*Beams (Structural), *Reinforced concrete), Captive tests, Reinforcing materials, Steel, Aluminum, Glass textiles, Iterative methods, Stresses, Flexural strength, Moments, Deflection, Loading (Mechanics), Ductility, Fracture (Mechanics), Strain (Mechanics), Compressive properties.

The report outlines a general iteration analysis procedure for estimating the flexural strength, the moment rotation, and the load-deflection characteristics of reinforced concrete members with arbitrary cross section and arbitrary reinforcement (but symmetrical about the plane containing the applied loads). The method is based on the traditional assumptions made in elementary beam theory and on the actual stress-strain relations of the reinforcement and concrete as determined in standard tests but does not specify compressive strain for concrete. Results of tests on 11 simply supported beams of 6-ft span reinforced with single or multiple layers of high-strength steel, aluminum, and fiber-glass rods, both with and without helical confining reinforcement in the compression zone, are described and compared with analytical results. Agreement of theory and experiment was considered satisfactory in the majority of tests. It was also found that: (a) Helical compressive reinforcement significantly increased the ductility of all beams and the load-carrying capacity of 'overreinforced' beams. (b) Deformed fiber-glass rods developed good bond with concrete, enabling the fiber-glass-reinforced beams to exhibit higher ultimate moments than their high-strength steel-reinforced

counterparts, despite deflections that were two or more times larger than those of the steel-reinforced beams. (c) The ultimate concrete compressive strain measured on the top beam surface preceding the formation of first spalls is a function of the strain gradient and varied from 0.003 to 0.007, depending on the strain gradient. (Author)
AD-669 609 HC$3.00 MF$0.65

ADVANCES IN FRACTURE TOUGHNESS CHARACTERIZATION PROCEDURES AND IN QUANTITATIVE INTERPRETATIONS TO FRACTURE-SAFE DESIGN FOR STRUCTURAL STEELS.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 11F.
AD-669 690 HC$3.00 MF$0.65

MATRIX METHODS AND AUTOMATION IN STRUCTURAL ENGINEERING.
Denver Univ., Colo. Research Inst.
W. F. Hubka, and A. West. 1966, 21p NASA-CR-71230
Grant NSG-518

Descriptors: *Computer programs, *Eigenvalues, *Eigenvectors, *Matrix methods, Algebra, Applications of mathematics, Digital computers, Numerical analysis, Polynomials, Population inversion, Roots of equations, Shell theory.

For abstract, see STAR 06 12.
N68-22384 HC$3.00 MF$0.65

AIRCRAFT ACCIDENT REPORT. FRONTIER AIRLINES, INC. DOUGLAS DC-3C, N65276, STAPLETON INTERNATIONAL AIRPORT, DENVER, COLORADO. DECEMBER 21, 1967.
National Transportation Safety Board, Washington, D. C.
For primary bibliographic entry see Field 1C.
PB-177 339-4 HC$3.00 MF$0.65

PILE-SOIL SYSTEM RESPONSE IN CLAY AS A FUNCTION OF EXCESS PORE WATER PRESSURE AND OTHER SOIL PROPERTIES.
Research rept.,
Texas Transportation Inst., College Station.
Tom P. Airhart, T. J. Hirsch, and Harry M. Coyle. Sep 67, 40p* RR-33-8
Prepared in cooperation with Texas State Highway Dept., and Bureau of Public Roads, Washington, D. C.

Descriptors: (*Clay, Soil mechanics), (*Foundations (Structures), Failure (Mechanics)), Pressurization, Water, Shear stresses, Underground structures, Instrumentation, Statistical analysis, Dynamics, Sampling, Mechanical properties, Response.
Identifiers: Piles (Structures), Pile driving.

The report concerns itself with an instrumented field test pile used to investigate the failure mechanisms which are developed in clay soils subjected to pile driving and foundation loadings. The ultimate load response of the pile-soil system was evaluated for both dynamic and static loadings. A test pile instrumented with pressure transducers, strain gages, and accelerometers was driven into a saturated clay at a site in Beaumont, Texas. Measurements of strains and acceleration of the pile were taken during driving. Pore pressure measurements were made at the pile-soil interface for a continuous period of 30 days after driving. Strain measurements were made during static load tests at 13 days and 30 days after driving. Soil borings were made for the in-situ, remolded, and reconsolidated conditions and at specific radial distances from the pile. Conventional tests were conducted on the soil samples to measure the changes in engineering properties for the different conditions. The most important single result of this study has been the determination of the mode of failure developed when a steel pile is driven and loaded in a cohesive soil. Both static and dynamic load responses for the pile-soil system considered in this study are a function predominately of the soil properties within the region of local shear failure. The region of local shear failure is in turn a function of the pile diameter. (BPR Abstract)
PB-177 890 HC$3.00 MF$0.65

MODULAR DESIGN APPLICATIONS STUDY (DECKHOUSE AND OUTFIT).
Henry (J. J.) Co., Inc., New York.
For primary bibliographic entry see Field 13J.
PB-178 196 HC$3.00 MF$0.65

APPENDIX. MODULAR DESIGN APPLICATIONS STUDY (DECKHOUSE AND OUTFIT).
Henry (J. J.) Co., Inc., New York
For primary bibliographic entry see Field 13J.
PB-178 197 HC$3.00 MF$0.65

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

THE TESTING OF CABLES, WIRES, STRAPS, ETC. (ISPYTANIYA TROSSOV, PROVOLOK, LENT I PR.).
American Meteorological Society Boston Mass
Nov 66, 19p Rept no. T-R-637
Contract AF 19 (628)-3880
Trans. from Tsentralnyi Aerogidrodinamicheskii Institut. Trudy (USSR), n33 chap9 1928, by George E. Brady, Jr.

Descriptors: (*Cables (Mechanical), Test methods), Wire, Instrumentation, Rods, Sensitivity, Drag, Wind, Velocity, Mathematical analysis, Thickness, Aerodynamic characteristics, USSR.
Identifiers: Translations.

The strength of cables, wires, straps, tubing, etc. has been tested with a special instrument called the cable tester. The instrument is mounted on flat tunnel No. 1. It is set up as follows: The axis of the instrument, steel tube AB, rests on antifriction rollers R and R sub 1, which are similar to the rollers used in the Atwood machine. Two arms, D and D sub 1, are hinge-mounted at the ends of rod AB and turn on axes perpendicular to axis AB. The sensitivity of the instrument is regulated by displacement of weight m along a vertical axis attached to axis AB of the instrument. The displacement of weights Q and Q sub 1 causes the instrument's center of gravity to shift horizontally. (Author)
AD-669 162 HC$3.00 MF$0.65

FLUSH-MOUNTED PRESSURE TRANSDUCER SYSTEMS AS SPATIAL AND SPECTRAL FILTERS.
Research and development rept.,
Naval Ship Research and Development Center Washington D C Acoustics and Vibration Lab
George Maidanik. Mar 68, 13p
NSRDC-2651
Availability: Published in Journal of the Acoustical Society of America, v42 n5 p1017-24 Nov 1967.

Descriptors: (*Transducers, *Filters (Electromagnetic wave)), Pressure, Turbulent boundary layer, Response, Frequency, Geometry, Density, Signal-to-noise ratio, Design.
Identifiers: Spatial filters, Spectral filters.

Analysis of the responses of a flush-mounted transducer system to the pressure field in a turbulent boundary layer and to the boundary pressure field induced by an incident plane acoustic wave is formulated and discussed. The transducer system is considered as a spatial and a spectral filter. The properties of the filters are defined and illustrated for the case where the system consists of nominally identical transducers. The analysis is limited to geometries where the centers of the transducers are regularly placed at the centers of a plane rectangular grid. Time delays between transducers are allowed for in this analysis. (Author)
AD-669 202 Not available from CFSTI.

TECHNIQUES FOR MEASUREMENT OF DYNAMIC STABILITY DERIVATIVES IN GROUND TEST FACILITIES,
Advisory Group for Aerospace Research and Development Paris (France)
C. J. Schueler, L. K. Ward, and A. E. Hodapp, Jr.
Oct 67, 227p Rept no. AGARD-ograph-121
NATO Furnished.

Descriptors: (*Wind tunnels, *Data processing systems), Test methods, Aerodynamic characteristics, Model tests, Dynamics, Measurement, Moments, Equations of motion, Gas bearings, Roll, Balances, Design, Damping, Stability.

Some of the techniques in current use for measuring dynamic stability derivatives in wind tunnels are described, with emphasis given to the important features of balance system design, data reduction methods, instrumentation and typical balance systems. The use of gas bearings for dynamic stability and roll damping balances is treated and a three-degree-of-freedom balance system employing a spherical gas bearing is described. (Author)
AD-669 227 HC$3.00 MF$0.65

TEMPERATURE CORRECTIONS IN FALLING PARTICLE-MOLECULAR BEAM EXPERIMENTS,
Goucher Coll Towson Md
John C. Miklosz, Jr., and Ernest W. Bloore. May 68, 14p
NDL-TM-41
Contract AT (49-7)-2883

Descriptors: (*Molecular beams, Temperature), Radioactive fallout, Simulation, Furnaces, Particles, Emissivity, Specific heat, Thermal conductivity.

The effect of temperature variation in a falling particle molecular beam furnace on the temperature of a falling particle is considered. It is found that for any given furnace temperature distribution, limits can be set on the deviation of the particle temperature as it passes through the molecular beam. These limits are independent of intrinsic properties of the particle such as emissivity, specific heat, thermal conductivity, and size. (Author)
AD-669 236 HC$3.00 MF$0.65

FREQUENCY ACCURACY OF THE BARIUM OXIDE BEAM TUBE.
Technical rept.,
Army Electronics Labs Fort Monmouth N J
H. Hellwig. Jan 68, 25p Rept no. ECOM-2935

Descriptors: (*Frequency, *Standards), (*Electron tubes, Molecular beams), Barium compounds, Oxides, Performance (Engineering), Molecular energy levels, Zeeman effect, Stark effect, Doppler effect, Magnetic fields, Electric fields, Stability.
Identifiers: Quantum electronics, Frequency standards, Barium oxide.

A theoretical treatment of the properties of the barium oxide molecular beam tube in terms of its frequency precision is presented. Numerical results for a given beam tube design are derived. The influence of magnetic and electric fields, the Doppler effect, cavity pulling, and the exciting R. F. spectrum are discussed. The results are summarized by stating the requirements for a frequency accuracy of better than 10 to the -12th power with respect to the natural molecular transition frequency. Such a beam tube seems feasible and capable of operating unshielded in magnetic environments of several hundred Gauss. (Author)
AD-669 259 HC$3.00 MF$0.65

CHARACTERISTICS OF THE DYNAMIC CALIBRATION OF AN INSTRUMENT FOR MEASURING THE INSTANTANEOUS TEMPERATURES OF GAS FLOWS (OSOBENNOSTI DINAMICHESKOI TARIROVKI APPARATURY DLYA IZMERENIYA MGNOVENNYKH TEMPERATUR GAZOVYKH POTOKOV),

Foreign Technology Div Wright-Patterson AFB Ohio

For primary bibliographic entry see Field 20D.

AD-669 271 HC$3.00 MF$0.65

A TUBE WIND TUNNEL FOR HIGH REYNOLDS NUMBER SUPERSONIC TESTING,

Cornell Aeronautical Lab Inc Buffalo N Y
Theodore J. Falk. Feb 68, 47p Rept no. CAL-AD-2297-A-1
ARL-68-0031
Contracts AF 33 (615)-5389, AF 33 (657)-8860

Descriptors: (*Supersonic wind tunnels, Design), Reynolds number, Supersonic planes, Transport planes, Commercial planes, Costs, Diaphragms (Mechanics), Vacuum apparatus, Tanks (Containers), Pressure, Heat transfer, Skin friction, Feasibility studies.
Identifiers: Ludwieg tubes, Supersonic transport planes.

A modified Ludwieg tube wind tunnel which offers the possibility of high (i.e., full-scale) Reynolds number supersonic testing for the supersonic transport at relatively low cost is described. The modifications, consisting of a revised diaphragm location and a large downstream vacuum tank, are intended to reduce the starting time and starting loads found to exist in the basic Ludwieg tunnel. The operating characteristics of a short flow duration tunnel of this type are discussed along with the problems of instrumentation for a minimum design flow duration equal to one-twentieth of a second. It is anticipated that pressure, heat transfer, and skin friction data can be obtained with instrumentation similar to that now in use. Force data of the precision required for SST tests, however, are expected to be more difficult to obtain. (Author)

AD-669 353 HC$3.00 MF$0.65

AN ANALYSIS OF JAPANESE CURRENT METER ARRAYS.

Naval Oceanographic Office Washington D C

For primary bibliographic entry see Field 8C.

AD-669 436 HC$3.00 MF$0.65

AN ANALYSIS OF TRANSIENT CALORIMETRY,

Naval Ordnance Lab White Oak Md
Bruce Hartmann. 9 Apr 68, 31p* Rept no. NOLTR-68-35

Descriptors: (*Calorimetry, *Heat flux), Calorimeters, Theory, Design, Accuracy, Flames, Arc heaters, Wind tunnels.
Identifiers: Transient calorimeters.

The theory and design of a transient calorimeter for convective and radiant heating rate measurements are presented. The major sources of error are pointed out, including: thermal gradients in the slug, heat losses, variable thermal properties, variable heat flux, and surface effects. It is shown that the NOL calorimeter can be depended on for an accuracy of about plus or minus 5%. Experimental measurements in an oxyacetylene burner, arc image furnace, and arc wind tunnel are presented. The measured heat fluxes range from about 20 cal/sq cm sec (74 BTU/sq. ft sec) to 270 cal/sq cm sec (1000 BTU/sq ft sec). In addition to the results for the NOL calorimeter, a general survey of work done by others is presented. (Author)

AD-669 446 HC$3.00 MF$0.65

INSTRUMENTATION FOR TIME-RESOLVED MASS SPECTROMETRY APPLICATION TO LASER-VAPORIZATION OF SOLID MATERIALS,

Naval Radiological Defense Lab San Francisco Calif
Kenneth A. Lincoln. 7 Mar 68, 24p* Rept no. USNRDL-TR-68-36

Descriptors: (*Mass spectroscopy, *Lasers), (*Ablation, Mass spectroscopy), Polymers, Refractory materials, Vaporization, Heating, Sublimation.

A technique has been developed for coupling a pulsed laser with a time-of-flight mass spectrometer so that low vapor pressure materials, such as, polymers and refractories, can be vaporized directly in the ion source of the spectrometer. Concomitantly, the instrumentation for recording time-resolved mass spectra has been improved to permit more quantitative measurements of short-lived species, and is applicable to any mass spectral analysis of transient events in the submillisecond (or longer) time domain. Two types of time resolution are possible; the first gives the duration of all the mass peaks (within a designated range), and the second can present the intensity of any six preselected mass peaks as a function of time for each laser pulse. Performance of the laser-mass spectrometer system has demonstrated its ability to conveniently vaporize such refractory materials as graphite and readily discriminate between the transient vapors like C3 and the stable ones, such as, C2H2. Moreover, laser heating has manifested a very practical advantage in the elimination of background spectra due to heated sample containers and support structures. (Author)

AD-669 453 HC$3.00 MF$0.65

LIMIT GAGES FOR MEASURING WIND VELOCITIES.

Naval Civil Engineering Lab Port Hueneme Calif

For primary bibliographic entry see Field 4B.

AD-669 455 HC$3.00 MF$0.65

DEVELOPMENT OF A SUPERSONIC NOZZLE MOLECULAR BEAM FACILITY,

California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
David R. Miller. Apr 68, 33p Rept no. IPAPS-67/68-212
AROD-5133:169-P
Contract DA-31-124-ARO (D)-257

Descriptors: (*Molecular beams, *Test facilities), Supersonic nozzles, Vacuum pumps, Nozzle gas flow, Superaerodynamics, Interactions, Surfaces, Design, Operation.
Identifiers: Defender project.

A supersonic nozzle molecular beam facility was developed and operated. Design, fabrication and operation of the major components of the vacuum system are described. Several of the important experimental components to be used in beam experiments are also described. Selected performance results are presented which indicate that the system is operating correctly and that beam characteristics are the same as those obtained in other laboratories. (Author)

AD-669 490 HC$3.00 MF$0.65

HARMONIC ANALYZER FOR MEASURING FIRST AND SECOND DERIVATIVES OF I-V CHARACTERISTICS OF TUNNEL DIODES AND POINT-CONTACT DIODES,

Foreign Technology Div Wright-Patterson AFB Ohio

For primary bibliographic entry see Field 9A.

AD-669 514 HC$3.00 MF$0.65

DESIGN AND DEVELOPMENT OF A SERVO-CONTROLLED GAS INBLEED SYSTEM FOR A HIGH VACUUM CALIBRATION CHAMBER.

Final rept. 1 Mar-1 Sep 67,
Arnold Engineering Development Center Arnold Air Force Station Tenn
Albert J. Mathews, and Fred M. Shofner. May 68, 41p* Rept no. AEDC-TR-68-100
Contract AF 49 (600)-1200
Prepared in cooperation with ARO, Inc., Arnold Air Force Station, Tullahoma, Tenn.

Descriptors: (*Pressure gages, Calibration), (*Calibration, Vacuum apparatus), Servomechanisms, Gas flow, Design, Analog computers, Feasibility studies, Pneumatic valves, Pressure.
Identifiers: Servo control valves, Computer aided design.

A servocontrolled gas inbleed system for a dynamic, calibrated conductance type of vacuum calibration system was designed and fabricated. The servocontrolled gas inbleed system automatically regulates the flow of gas into the test region of the calibration system by maintaining a constant pressure on the upstream side of a molecular leak. Constant pressure on the molecular leak is established and maintained by a shunt control technique in which a gas inlet valve and a gas pumpout valve are operated in parallel. An analog computer was used to aid in the design of the system. The transient and steady-state response of the servocontrolled gas inbleed system is predicted by the computer. Good agreement was obtained between the analog computer data and the experimental performance data obtained from the gas inbleed system. The gas inbleed system can control the flow rate in the range from 0.00001 torr-liters/sec to 0.001 torr-liters/sec. Other flow rates are obtainable by changing system components; however, the same design procedure is applicable. (Author)

AD-669 562 HC$3.00 MF$0.65

DETERMINATION OF TRANSIENT GAS CONSTITUENT CONCENTRATIONS UTILIZING A HIGH ENERGY ELECTRON BEAM.

Final rept. 1 Nov 66-1 Apr 67,
Arnold Engineering Development Center Arnold Air Force Station Tenn
R. G. Whetsel. May 68, 65p Rept no. AEDC-TR-68-88
Contract AF 40 (600)-1200
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Master's thesis.

Descriptors: (*Shock tubes, Gas analysis), (*Helium, Concentration (Chemistry)), Interfaces, Air, Electron beams, Aerodynamic characteristics, Gas detectors, Spectroscopy, Fluorescence, Excitation, Mixtures, Theses.
Identifiers: Shock tunnels, Driver gases.

In order to determine the available test time in a helium driven shock tunnel, an interface detection system was developed to indicate the arrival of helium driver gas at the test section. This is done by exciting the gas at the test section with a high energy electron beam and spectroscopically analyzing the resulting fluorescence to determine the helium concentration. Relative values of helium and air emission intensities are calculated and compared with experimental data from both static and transient gas mixtures. (Author)

AD-669 564 HC$3.00 MF$0.65

PLASMA FRONT STUDIES.

Vanderbilt Univ Nashville Tenn Dept of Physics

For primary bibliographic entry see Field 20I.

AD-669 572 HC$3.00 MF$0.65

DEVELOPMENT OF INSTRUMENTATION WHICH WILL ALLOW MEASUREMENT OF THE INFRARED REFRACTIVE INDEX OF OZONE.

Final rept. 12 Apr 67-20 Apr 68,
Block Engineering Inc Cambridge Mass
James W. Meehan. Apr 68, 19p
AFCRL-68-0207
Contract F19628-67-C-0235

Descriptors: (*Ozone, Refractive index), (*Refractometers, Design), (*Infrared optical systems, Refractometers), Interferometers, Monochromators, Mirrors, Design.

Group 14B—Laboratories, test facilities, and test equipment

The high temperature Michelson-type refractometer was modified during this work. Specifically, an additional vacuum chamber was installed to accommodate a commercial monochromator. In addition, the mirror mounts in the Michelson interferometer were changed to provide more stability. The monochromator and the interferometer were integrated into a single operating system. During this integration some modifications were incorporated in the monochromator. (Author)
AD-669 576 HC$3.00 MF$0.65

TEMPERATURE DEPENDENCE OF THE CALORIC RADIOMETER AND ITS COMPENSATION.
Army Electronics Command Fort Monmouth N J
For primary bibliographic entry see Field 20M.
AD-669 593 HC$3.00 MF$0.65

MEASUREMENT OF NATURAL PARTICULATE FALLOUT ONTO HIGH POLAR ICE SHEETS. PART II. ANTARCTIC AND GREENLAND CORES.
Research rept.,
Cold Regions Research and Engineering Lab Hanover N H
Wayne L. Hamilton. Mar 67, 36p Rept no. CRREL-RR-139-Pt-2
See also Part 1, AD-630 902.

Descriptors: (*Glaciers, Impurities), (*Ice, Antarctic regions), Particle size, Snow, Particles, Stratigraphy, Periodic variations, Well logging, Sequences, Correlation techniques, Sampling, Distribution, Computer programs, Dust, Greenland.

Greenland and Antarctica ice samples were analyzed for size distribution of the particlate content. Samples are from Little America V, age 800 yr; Byrd Station, age 1340 yr; Byrd Station, age 450 yr; and Site 2, Greenland, age 220 yr. Particle concentration is lower in the younger Byrd samples than in the older ones. Concentration was seen to vary cyclically with depth. Annual accumulation determined by peak to peak measurement on the dust concentration profiles compares favorably with that determined by surface stratigraphy. The results indicate that winter snow is dirtier, mean particle size changes as a result of relatively discrete addition of well sorted fallout to the log-normal distribution, and that annual accumulation of dust was about 8 times higher in Greenland than in Antarctica at the times represented by the samples studied. (Author)
AD-669 612 HC$3.00 MF$0.65

A FAST RECOVERY PROBE AND RECEIVER FOR PULSED NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY.
Pittsburgh Univ Pa Dept of Physics
I. J. Lowe, and C. E. Tarr. 13 Nov 67, 5p
AFOSR-68-0931
Grant AF-AFOSR-196-66
Availability: Published in Journal of Scientific Instruments (Journal of Physics E), Series 2 v1 p320-2 1968.

Descriptors: (*Nuclear magnetic resonance, Instrumentation), Spectrometers, Probes, Transmission lines, Radiofrequency power.

A single coil probe and receiver for use in pulsed nuclear magnetic resonance experiments are described. The impedance transformation properties of a one-quarter wavelength line are used to protect the receiver during the radio-frequency pulse. The probe is very efficient in its use of r.f. power to create an oscillating magnetic field, and the overall system has a fast recovery time (less than 4 microsec. at 30 MHz). (Author)
AD-669 638 Not available from CFSTI.

ENVIRONMENTAL EFFECTS REPORT FOR HELICOPTER INSTRUMENT TRAINER DEVICE 2B10A.
Melpar Inc Falls Church Va
For primary bibliographic entry see Field 1C.
AD-669 671 HC$3.00 MF$0.65

A RELIABLE GALVANOMETER MOVEMENT FOR USE IN SPACE APPLICATIONS.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
C. T. Farr. Oct 67, 27p Rept no. RAE-TR-67260

Descriptors: (*Galvanometers, Spaceborne), Space environmental conditions, Vacuum, Weight, Satellites (Artificial), Design, Power supplies, Test methods, Sensitivity, Vibration, Response, Deflection, Wear resistance, Bearings, Life expectancy, Great Britain.

The report describes the tests performed on a small galvanometer movement, using a pivot-jewel bearing, to assess its suitability for use in space applications. Although only a small number of units was tested, the results suggest that with minor modifications, the mechanism is reliable under a space environment and well suited to certain satellite applications due to its small size, weight, and extremely low power consumption. (Author)
AD-669 674 HC$3.00 MF$0.65

CONCEPT, DESIGN, AND PERFORMANCE OF THE MSC SPACECRAFT ACOUSTIC LABORATORY.
National Aeronautics and Space Administration. Manned Spacecraft Center, Langley Station, Va.
W. D. Dorland, K. M. Eldred, J. D. Johnston, Jr., and R. J. Wren. Mar 68, 54p NASA-TM-X-58017

Descriptors: *Acoustic simulation, *Apollo spacecraft, *Flight simulators, *Vibration simulators, Horns, Noise propagation, Pressure measurements, Sound generators, Sound waves, Test facilities.

For abstract, see STAR 06 12.
N68-21874 HC$3.00 MF$0.65

THE EFFECTS OF CLEANING A LANGMUIR PROBE.
Royal Aircraft Establishment, Farnborough (England).
T. G. Wills. Jan 67, 41p RAE-TR-67037

Descriptors: *Cleaning, *Electrostatic probes, Argon plasma, Electron energy, Heat treatment, Hypervelocity projectiles, Molybdenum, Plasma density, Plasma heating, Platinum, Tungsten.

For abstract, see STAR 06 12.
N68-21986 HC$3.00 MF$0.65

FLIGHT INVESTIGATION OF A CAPACITANCE-TYPE METEOROID DETECTOR USING AN INFLATABLE PARAGLIDER.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. H. Siviter, Jr.. May 68, 42p NASA-TN-D-4530
Contract 124-09-14-02-23

Descriptors: *Flight tests, *Hypervelocity impact, *Inflatable gliders, *Micrometeoroids, *Polyethylene terephthalate, Aerobee rocket vehicle, Capacitors, Penetration, Sensors.

For abstract, see STAR 06 12.
N68-22290 HC$3.00 MF$0.65

VIRTUAL IMAGE OUT-THE-WINDOW DISPLAY SYSTEM STUDY. VOLUME 2 - APPENDIX.
Farrand Optical Co., Inc., New York.
M. Baum, R. Bull, L. Mayer, J. L. Russa, and M. Shenker. Jan 66, 411p NASA-CR-65303
Contract NAS9-3678

Descriptors: *Display devices, *Imaging techniques, Abstracts, Bibliographies, Simulators, Surveys, Tables (data).

For abstract, see STAR 06 12.
N68-22591 HC$3.00 MF$0.65

CELL FOR STUDYING ELECTRON-ADSORBED GAS INTERACTIONS.
Cellule D Etudes des Interactions Electron- Gaz Adsorbe
Commissariat A L Energie Atomique, Saclay (France).
D. A. Degras, and H. Golowacz. Dec 67, 15p
CEA-R-3402
Lang- in French

Descriptors: *Adsorption, *Electron gas, *Gasion interactions, *Ionized gases, Carbon monoxide, Gas analysis, Gas ionization, Mass spectrometers, Neon.

For abstract, see STAR 06 12.
N68-22684 HC$3.00 MF$0.65

LARGE-AREA, PYRO-ELECTRIC, RADIATION RECEIVER.
Royal Radar Establishment, Malvern (England).
L. S. Kremenchugskii, A. F. Malnev, and V. V. Samoilov. 1966, 8p RRE-TRANS-172, TIL/OT/8695
Tran- Transl. Into English From Pribory I Tekhn. Eksperim., (Moscow), Pt. 6, 1966 P 169-171

Descriptors: *Pyroelectricity, *Radiation detectors, *Sensitivity, Barium titanates, Ceramics, Equivalent circuits, Polarization characteristics, Single crystals.

For abstract, see STAR 06 12.
N68-22693 HC$3.00

A SOLID STATE DETECTOR EXPERIMENT FOR ELECTRON MEASUREMENTS ON OGO-F.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
J. H. Trainor, and D. J. Williams. 1968, 16p
NASA-TM-X-63195, X-611-68-119

Descriptors: *Electron radiation, *Ogo, *Solid state devices, Electron density profiles, Electron scattering, Onboard equipment, Spacecraft instruments, Spectrometers.

For abstract, see STAR 06 12.
N68-22703 HC$3.00 MF$0.65

OIL-LEAK DETECTOR.
Detecteur de Fuite D Huile
Commissariat A L Energie Atomique, Saclay (France).
L. Bacchiani, D. Da Costa Viera, P. Fierard, and N. Lions. Dec 67, 34p CEA-R-3322
Lang- in French

Descriptors: *Detection, *Leakage, *Oils, *Warning systems, Cables (ropes), Capacitors, Indicating instruments.

For abstract, see STAR 06 12.
N68-22724 HC$3.00

VIEWING DEVICES FOR OBSERVING FLOW CONDITIONS IN HOT MERCURY SYSTEMS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
D. W. Medwid, and L. A. Mueller. May 68, 22p
NASA-TM-X-1578
Contract 170-04-00-02-22

Descriptors: *Fluid flow, *Mercury vapor, *Pipes (tubes), *Structural design, *Temperature effects, *Windows (apertures), Condensation, Glass, Leakage, Mercury (metal), Pressure vessels, Sealing, Thermal expansion.

For abstract, see STAR 06 12.
N68-22737 HC$3.00 MF$0.65

EXPERIMENTAL ASSEMBLY AND STERILIZATION LAB. PERSONNEL PROCEDURES FOR EASL OPERATIONS - JPL PROCEDURES EASL 201.01.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
E. J. Lunney, and H. C. Schwartz. 15 Apr 67, 12p NASA-CR-94351, AVSSD-0135-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Clean rooms, *Laboratories, *Spacecraft contamination, *Sterilization, Assembling, Cleaning, Decontamination, Quality control, Standardization.

For abstract, see STAR 06 12.
N68-22765 HC$3.00 MF$0.65

STERILIZATION ASSEMBLY DEVELOPMENT LABORATORY, 3000 CU FT DECONTAMINATION CHAMBER. PHYSICAL PARAMETERS - MEASUREMENT PLAN, TASK 1.0.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
E. D. Lantis. 15 Aug 67, 13p NASA-CR-94392, AVSSD-0300-67-CR
Contracts NAS7-100, JPL-951624
Prep- Prepared for Jpl

Descriptors: *Decontamination, *Ethylene oxide, *Test chambers, Humidity, Quality control, Temperature, Tests.

For abstract, see STAR 06 12.
N68-22775 HC$3.00 MF$0.65

A STUDY OF THE EFFECTS OF VARYING THE ESTABLISHED OPERATING AND MAINTENANCE PROCEDURES OF THE EASL FACILITY.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Sterilization Assembly Development Lab.
E. M. Hajema. 15 Aug 67, 38p NASA-CR-94385
Contracts NAS7-100, JPL-951624, PHASE 2
Prep- Prepared for Jpl

Descriptors: *Laboratories, *Laminar flow, *Microorganisms, *Sterilization, Biological effects, Humidity, Microbiology, Personnel, Temperature, Test facilities.

For abstract, see STAR 06 12.
N68-22776 HC$3.00 MF$0.65

EXPERIMENTAL ASSEMBLY AND STERILIZATION LAB - ROUTINE CLEANING AND DECONTAMINATION.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
E. J. Lunney. 15 Apr 67, 17p NASA-CR-94390, AVSSD-0121-67-CR
Contract NAS7-100
Prep- Prepared for Jpl

Descriptors: *Cleaning, *Decontamination, *Laboratories, *Sterilization, Bioassay, Quality control, Safety, Test facilities.

For abstract, see STAR 06 12.
N68-22777 HC$3.00 MF$0.65

PROPELLANT LEAKAGE DETECTION SYSTEM FINAL REPORT.
Spacelabs, Inc., Van Nuys, Calif.
8 Apr 68, 191p NASA-CR-92086, SR-68-1050
Contract NAS9-6649

Descriptors: *Leakage, *Propellants, *Spacecraft propulsion, Failure, Flow velocity, Malfunctions, Reaction control, Sensors.

For abstract, see STAR 06 12.
N68-22780 HC$3.00 MF$0.65

CAPACITOR-TYPE METEOROID-PENETRATION SENSORS - DESCRIPTION AND TEST RESULTS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. J. Broderick. May 68, 109p NASA-TN-D-4524
Contract 124-09-14-02-23

Descriptors: *Capacitors, *Hypervelocity projectiles, *Impact testing machines, *Impact tests, *Meteorite collisions, Hypervelocity impact, Impact tolerances, Meteoritic damage, Meteoroid hazards, Space environment simulation.

For abstract, see STAR 06 12.
N68-22883 HC$3.00 MF$0.65

DEVELOPMENT OF A 50 K W FLUID TRANSPIRATION ARC SOLAR SIMULATOR FINAL REPORT.
Vitro Labs., West Orange, N. J.
D. R. Simon. Nov 67, 46p NASA-CR-92067, VL-2438-14-O
Contract NAS9-5726

Descriptors: *Electric arcs, *Solar simulators, *Transpiration, Arc chambers, Cooling, Electrodes, Life (durability), Quartz, Radiation sources.

For abstract, see STAR 06 12.
N68-22888 HC$3.00 MF$0.65

ELECTRODE-LESS CONDUCTIVITY METER.
Conductimetre Sans Electrode
Commissariat A L Energie Atomique, Saclay (France).
F. Bourg, and M. Degryse. Dec 67, 17p CEA-R-3344
Lang- in French

Descriptors: *Electrical conductivity meters, *Inorganic compounds, *Solutions, Electrical measurement, Electrical resistivity, Electrodes, Low conductivity, Ohmmeters.

For abstract, see STAR 06 12.
N68-23021 HC$3.00 MF$0.65

DESIGN, FABRICATION AND PERFORMANCE OF AN ELLIPSOIDAL SPECTROREFLECTOMETER.
General Dynamics/Convair, San Diego, Calif.
J. T. Neu. Mar 68, 108p NASA-CR-73193
Contract NAS2-3769

Descriptors: *Far infrared radiation, *Infrared spectrophotometers, Angular distribution, Ellipsoids, Maintenance, Performance, Radiation counters, Reflectance.

For abstract, see STAR 06 12.
N68-23029 HC$3.00 MF$0.65

THE DEVELOPMENT OF ULTRASONIC NONDESTRUCTIVE TESTING INSTRUMENTATION TO MEASURE PAVEMENT THICKNESS.
Interim technical rept. no. 3, 4 Jan 65-30 Dec 66, Ohio State Univ., Columbus. Engineering Experiment Station.
Matthew J. Golis, Robert C. McMaster, Louis Toth, and Gary Cooper. Dec 66, 98p EES-208

Descriptors: (*Non-destructive testing, *Concrete), (*Ultrasonic radiation, Non-destructive testing), Test equipment, Test methods, Pavements, Measurement, Meters, Thickness, Attenuation, Analysis, Design, Reliability, Instrumentation, Roads, Acoustic impedance.

The Third Interim Technical Report on 'Development of Instrumentation to Measure Pavement Thickness' covers research during the two-year period from January 4, 1965, through December 30, 1966. During this period, a prototype thickness gage, identified as the O.S.U./O.D.H. Pavement Thickness Gage, has been developed. The gage has demonstrated accuracies of better than plus or minus 2% in gaging interstate highway pavement thicknesses. Field tests conducted on partially completed portions of Interstate 270 proved the effectiveness of the unit. The modified pulse-echo technique of testing pavement thickness as well as the developments leading up to the operational system are described. The field testing program used to evaluate the system as well as the proposed testing program for the future are also reviewed. The practicality of field use of this device, that is, the reduction in the size of the prototype gage so that it is readily portable, has yet to be accomplished. (Author)
PB-177 378 HC$3.00 MF$0.65

STUDY AND EVALUATION OF PAVEMENT CONDITION EQUIPMENT.
Ohio Dept. of Highways, Columbus.
For primary bibliographic entry see Field 13B.
PB-177 463 HC$3.00 MF$0.65

FILTERING CRUCIBLE-REACTION VESSEL.
Invention rept.,
Saint Edward's Univ., Austin, Tex. Dept. of Chemistry.
Thomas McCullough. 22 Nov 67, 1p
Grant NSF-GY-2982

Descriptors: (*Gravimetric analysis, Instrumentation), Filters (Fluid), Containers, Quantitative analysis, Microanalysis, Patents.
Identifiers: *Reactors (Chemical).

A brief description is given of the conversion of a filtering crucible to a reaction vessel in order to eliminate the need for transfering reaction products when performing gravimetric quantitative determinations with sub-milligram quantities.
PB-177 662 HC$3.00 MF$0.65

STUDIES OF A FLUIDIC OSCILLATOR AS A TEMPERATURE SENSOR,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 13G.
For abstract, see NSA 22 10.
UCRL-50344 HC$3.00 MF$0.65

14D. Reliability

THE AIRCRAFT INTEGRATED DATA SYSTEM, ACIDS.
Parks Coll of Aeronautical Technology East St Louis Ill
For primary bibliographic entry see Field 1C.
AD-669 262 HC$3.00 MF$0.65

BASIC PRINCIPLES, METHODS, AND OBJECTIVES OF RELIABILITY OPERATIONS.
Grundlagen, Methoden Und Ziele Der Zuverlaessigkeitsarbeit
Scripta Technica, Inc., Washington, D. C.
H. Gross. Apr 68, 16p NASA-TT-F-11545
Contract NASW-1694
Coll- 16 P Refs Tran- Transl. Into English From Jahrb. Wiss. Ges. Luft- Und Raumfahrt (Cologne), 1966 P 369-377

Descriptors: *Mathematical models, *Reliability engineering, Environmental tests, Quality control.

For abstract, see STAR 06 12.
N68-22348 HC$3.00 MF$0.65

FUEL CELL RELIABILITY ASSESSMENT QUARTERLY REPORT, 8 JAN. - 8 APR. 1968.
Allis-Chalmers Mfg. Co., Milwaukee, Wis. Advanced Electrochemical Products Div.
For primary bibliographic entry see Field 10B.
For abstract, see STAR 06 12.
N68-22811 HC$3.00 MF$0.65

14E. Reprography

TOWARDS A UNIFORM FEDERAL REPORT NUMBERING SYSTEM AND A CUDDLY MICROFICHE READER, TWO MODEST PROPOSALS,
Air Force Office of Scientific Research Arlington Va Directorate of Information Sciences
For primary bibliographic entry see Field 5B.
AD-669 204 HC$3.00 MF$0.65

THE STORAGE AND RETRIEVAL OF 'VISUALS',
Office of Aerospace Research Arlington Va Office of Scientific and Technical Information
For primary bibliographic entry see Field 5B.
AD-669 396 Not available from CFSTI.

THE TECHNOLOGY OF THERMOPLASTIC RECORDING OF IMAGES (TEKHNIKA TERMOPLASTICHESKOI ZAPISI IZOBRAZHENII),
Foreign Technology Div Wright-Patterson AFB Ohio
L. G. Tarasenko. 8 May 67, 38p Rept no. FTD-MT-66-75
Edited machine trans. of Zhurnal Nauchnoi i Prikladnoi Fotografii i Kinematografii (USSR) v10 n4 p298-312 1965.

Descriptors: (*Thermoplastics, *Photographic recording media), Photographic techniques, Optical phenomena, Electrooptical photography, Electron beams, Electron optics, Electrophotography, Schlieren photography, USSR.
Identifiers: Translations.

Thermoplastic recording has a number of advantages in comparison with such 'classical' methods of recording images as photography, electrophotography and magnetic recording. The most important advantages of thermoplastic recording are high resolving power, recording speed and no developing solvents. The principally new diffractional method of thermoplastic recording and production of color images ensures the possibility of achieving high-quality color transmission thanks to the additive principle of mixing colors. Offered only 8 years ago, thermoplastic recording is already applied in certain regions of technology: for recording and reproducing information, in computer technology, for producing film-copies (the Calvar process), etc. Many foreign firms are investigating the region of thermoplastic recording and the number of patents in this area is already more than two hundred. The application of thermoplastic recording for cosmic investigations is very promising. Along with further improvement of electrical methods of thermoplastic recording, at present the most important region of research and invention is development of optical methods of thermoplastic recording that can compete with photography and electrophotography. (Author)
AD-669 420 HC$3.00 MF$0.65

A LIGHTING STRATEGY FOR LUNAR ORBITER MISSION DESIGN.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
F. O. Huck. May 68, 38p NASA-TN-D-4501
Contract 814-11-00-03-23

Descriptors: *Lunar orbiter, *Spaceborne photography, *Terrain analysis, Cameras, Imaging techniques, Lunar photography, Lunar topography, Mission planning, Optimization, Photographs.

For abstract, see STAR 06 12.
N68-21942 HC$3.00 MF$0.65

A METHOD FOR PHOTOGRAPHING MICROWAVE WITH A POLAROID FILM INTERIM TECHNICAL REPORT.
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
K. Iizuka. Mar 68, 26p NASA-CR-94305, TR-558
Contracts NGR-22-007-056, N00014-67-A-0298-0005

Descriptors: *Electromagnetic fields, *Microwave frequencies, *Photographic film, Charge distribution, Color photography, Exposure, Holography, Mapping, Photographic developers, Temperature distribution.

For abstract, see STAR 06 12.
N68-22035 HC$3.00 MF$0.65

LUNAR PHOTO STUDY, PHASE 2 FINAL REPORT, 1 NOV. 1965 - 1 NOV. 1966.
Eastman Kodak Co., Rochester, N. Y. Apparatus and Optical Div.
G. T. Keeve, and E. D. Seymour. 1 Nov 66, 248p NASA-CR-92076, Z3841
Contract NAS9-3826

Descriptors: *Environment simulation, *Lunar photography, *Lunar topography, Climatology, Contours, Data processing, Data reduction, Lunar maps, Photographic equipment, Photometry, Quality control.

For abstract, see STAR 06 12.
N68-22467 HC$3.00 MF$0.65

15. MILITARY SCIENCES

15A. Antisubmarine Warfare

SYSTEM ORGANIZATION FOR ASW SYSTEMS EVALUATION,
Atlantic Fleet Norfolk Va Antisubmarine Warfare Force
Allen E. McMichael. May 68, 23p Rept no. ASW-101B11.102

Descriptors: (*Antisubmarine warfare, Systems engineering), Antisubmarine defense systems, Weapon systems, Naval research, Organizations, Naval operations, Effectiveness, Research program administration, Hunter-killer groups, Ocean surveillance, Operations research.

The Navy has had some difficulty acquiring statistically valid data on complete mixtures of weapons systems. Yet this is how fleet operators use the systems rather than employing them as individual tactical units. The Chief of Naval Operations (Op-95) has established an organization to accomplish this goal by assisting the fleet commander to gather these data during specific exercises conducted within the Atlantic ASW System. This paper describes the structure, mission, and progress of this in-house development. (Author)
AD-669 689 HC$3.00 MF$0.65

15C. Defense

SPECIALIZED EVALUATIONS OF SHELTER EQUIPMENT AND PROCEDURES.
Final rept.,
General American Transportation Corp Niles Ill General American Research Div
Harry A. Meier, Robert W. Smith, and Michael W. Gaynor. Jan 68, 192p* Rept no. GARD-1292-F
OCD-1522A

Descriptors: (*Radioactive fallout, Shelters), (*Confined environments, Survival kits), Civil defense systems, Ventilation ducts, Illumination, Tanks (Containers), Management planning, Models (Simulations), Model tests, Radiation monitors, Instruction manuals, Construction, Performance (Human), Reaction (Psychology), Questionnaires, Failure (Mechanics), Group dynamics, Operation.

Three series of tests evaluated a ventilation kit, lighting kit, and dual-purpose container for functional adequacy and ease of assembly and operation in simulated fallout shelter environments. The first series of tests used 2-man teams and light and dark conditions, the second series 6-man teams, and the third series 400 people in a 48 hour shelter occupancy. The first and second test series evaluated and revised assembly and operating instructions, and developed shelter manager 'focus aides' to eliminate difficulties discovered. (Author)
AD-669 258 HC$3.00 MF$0.65

DEFENSE PLANNING AND BUDGETING: THE ISSUE OF CENTRALIZED CONTROL,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5A.
AD-669 337 HC$3.00 MF$0.65

'SHELL GAME' ASPECTS OF MOBILE TERMINAL ABM SYSTEMS,
Rand Corp Santa Monica Calif
R. E. Strauch. Dec 67, 52p Rept no. RM-5474-ARPA
Contract DAHC15-67-C-0141, ARPA Order-189-1

Descriptors: (*Antimissile defense systems, Game theory), (*Terminal defense, Deployment), Mathematical models, Mobile, Interception, Guided missile targets, Deployment, Theorems, Reliability, Kill probabilities, Airborne, Threat evaluation, Countermeasures, Operations research.
Identifiers: *Mobile defense systems.

A two-person zero-sum game is used to model the mobile defense problem in order to examine, in the context of terminal ballistic missile defense, the advantages that accrue to the defender from being able to deny the attacker knowledge of the defense deployment. The marginal exchange ratio is shown to be quite favorable to the defender using mobile interceptors if the fraction of the target system that he wishes to protect is small. A combination of mobile defense and deceptive basing appears to be an extremely attractive defense option, since the mobile defense raises the price the attacker must pay to destroy a single target, while the deceptive basing increases the number of targets at which he must pay that price. (Author)
AD-669 461 HC$3.00 MF$0.65

EMERGENCY MOBILIZATION FOR POSTATTACK REORGANIZATION.
Final rept.,
Hudson Inst Inc Harmon-on-Hudson N Y
William M. Brown. 15 May 68, 66p Rept no. HI-874/2-RR
OCD-3522A

Descriptors: (*Civil defense systems, Mobilization), (*Nuclear warfare, Recovery), Countermeasures, Costs, Early warning systems, Advanced planning, Nuclear warfare casualties, Survival, Reaction (Psychology), Food, Stock level control, Industries, Transportation, Vulnerability, History, Disasters.
Identifiers: Postattack operations.

The report emphasizes the dangers to eventual reconstruction that are posed by the disorganization inevitably following a nuclear war. What can

go wrong in this reorganization period is examined by the use of scenarios and analogy. It is then suggested that during the crisis period preceding a nuclear war a number of useful actions enhancing the chance of postattack recovery should be undertaken as part of an emergency mobilization for civil defense. This mobilization might instigate actions which would help U.S. society to negotiate the reorganization period successfully. The problems of creating such countermeasures appear to be formidable but possible if: (a) the usable warning provided by the crisis is of sufficient duration (several weeks or more); and (b) the pre-planning for the mobilization action is completed in advance of the need. (Author)
AD-669 623 HC$3.00 MF$0.65

UNUSUAL COMMUNICATIONS TECHNIQUES.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 17B.
AD-669 635 HC$3.00 MF$0.65

INSTITUTIONAL FACTORS IN TOTAL VULNERABILITY,
Stanford Research Inst Menlo Park Calif
Francis W. Dresch, and Hazel B. Ellis. Apr 68, 99p
OCD-4341A

Descriptors: (*Economics, Vulnerability), (*Nuclear warfare, *Industries), National defense, Nuclear explosion damage, Housing, Banking, Organizations, Commerce, United States Government, Management planning, Law, Money, Civil defense systems, Systems engineering, National defense, Recovery.
Identifiers: Postattack operations.

A systems approach was used to identify institutional problems likely to be neglected in analyses of the vulnerability of physical systems at risk from nuclear attack. This report discusses six specific problems (solvency, credit, business organization and management, interdiction of normal business channels, legislative imbalance, and disruption of election machinery) and their implications for the assessment of national vulnerability. None of the problems would pose insurmountable difficulties but all would require prompt attention and appropriate resolution within the first two months after a nuclear attack. (Author)
AD-669 637 HC$3.00 MF$0.65

REPORT OF WORKING GROUP ON EFFECTIVENESS MEASURES FOR OPTICALLY DIRECTED AIR DEFENSE WEAPONS.
Department of the Air Force Washington D C
27 Jun 67, 21p
Prepared in cooperation with Department of the Army.

Descriptors: (*Antiaircraft defense systems, Effectiveness), Mathematical models, Antiaircraft gunnery, Rockets, Surface-to-air, Optical equipment, Simulation, Errors, Aerial targets, Target acquisition.

The objective of the Working Group is to bring together a panel of nationally recognized authorities in the field of mathematical modeling to study a selection of existing models, to select the better of the current models and to outline needed experiments to insure development of improved models for future use. A model is defined as the mathematical representation of an optically directed ground based anti-aircraft system. Models to be considered will be limited to those which depict ground-to-air gun or free rocket systems employed against air-breathing aircraft, from the instant when optical acquisition of the target is possible to that when the projectile is intended to have its terminal effect. (Author)
AD-669 680 HC$3.00 MF$0.65

15E. Logistics

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. I. SUMMARY OF THE STUDY.
American Institutes for Research Pittsburgh Pa
For primary bibliographic entry see Field 5I.
AD-669 397 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. II. IDENTIFICATION OF TRAINING CONTENT.
American Institutes for Research Pittsburgh Pa
For primary bibliographic entry see Field 5I.
AD-669 398 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. III. DERIVATION OF TRAINING CHARACTERISTICS,
American Institutes for Research Pittsburgh Pa
For primary bibliographic entry see Field 5I.
AD-669 399 HC$3.00 MF$0.65

DEVELOPMENT OF CORE TRAINING FOR F-86D ELECTRONIC MAINTENANCE POSITIONS. IV. PRINCIPLES AND TECHNIQUES.
American Institutes for Research Pittsburgh Pa
For primary bibliographic entry see Field 5I.
AD-669 400 HC$3.00 MF$0.65

15F. Nuclear Warfare

EMERGENCY MOBILIZATION FOR POSTATTACK REORGANIZATION.
Hudson Inst Inc Harmon-on-Hudson N Y
For primary bibliographic entry see Field 15C.
AD-669 623 HC$3.00 MF$0.65

INSTITUTIONAL FACTORS IN TOTAL VULNERABILITY,
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 15C.
AD-669 637 HC$3.00 MF$0.65

15G. Operations, Strategy, and Tactics

SIMULATION TECHNIQUES FOR ANALYZING AIR COMBAT SYSTEMS,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 1C.
AD-669 318 HC$3.00 MF$0.65

AN INTERDICTION MODEL FOR SPARSELY TRAVELED NETWORKS,
Rand Corp Santa Monica Calif
Richard D. Wollmer. Apr 68, 46p Rept no. RM-5539-PR
Contract F44620-67-C-0045

Descriptors: (*Counterinsurgency, War games), Insurgency, Networks, Graphics, Optimization, Effectiveness, Probability, Iterative methods, Algorithms, Computer programs, Mathematical models.
Identifiers: FLOG Computer program, IBM 7044 computers, Interdiction, Infiltration.

The report presents an algorithm and FORTRAN IV computer program for choosing locations at which to place assault forces to prevent infiltrators from proceeding through a transportation or supply network. Interdiction is by direct assault rather than by reducing the throughout capacity of a supply network. The model assumes that the strategy for placing forces is known to the infiltrator and that he will choose a path through the network that maximizes his probability of successful traverse. Inputs to the model are a list of the arcs and nodes of the network, the number of forces available to stop the infiltrator, and the probabilities for stopping him at the arcs and nodes as functions of the number of forces placed there. The model calculates the optimal placement when one force is available, and the optimal or nearly optimal placement of forces when multiple forces are available. (Author)
AD-669 320 HC$3.00 MF$0.65

JUDGE: A LABORATORY EVALUATION,
Rand Corp Santa Monica Calif
Louis W. Miller, Richard J. Kaplan, and Ward Edwards. Mar 68, 42p Rept no. RM-5547-PR
Contract F44620-67-C-0045

Descriptors: (*Tactical air support, War games), Close support, Military requirements, Man-machine systems, Decision making, Kill probabilities, Students, Effectiveness, Correlation techniques.
Identifiers: JUDGE (Judged Utility Decision Generator), Computer analysis.

An experiment was performed to evaluate the effectiveness of JUDGE (Judged Utility Decision Generator), an advanced man-machine technique for allocating and dispatching missions in response to requests for immediate close air support when resources are limited. Using JUDGE, each subject evaluated the target worth by comparing it with a carefully defined standard target (taken as 100). A computer program then translated these responses into dispatching decisions and evaluated them based on the subject's value responses. Using DASC (Direct Air Support Center), the subject himself assigned aircraft to target, allocating any even number from 0 to 16. JUDGE is shown to be superior to DASC when measured by an expected utility criterion. (Author)
AD-669 323 HC$3.00 MF$0.65

HANDBOOK FOR MILITRAN ANALYSTS.
Gulton Systems Research Group Inc Arlington Va
For primary bibliographic entry see Field 9B.
AD-669 438 HC$3.00 MF$0.65

'SHELL GAME' ASPECTS OF MOBILE TERMINAL ABM SYSTEMS,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 15C.
AD-669 461 HC$3.00 MF$0.65

LIFTING OF AERODYNAMIC DECELERATORS.
Stencel Aero Engineering Corp Asheville N C
For primary bibliographic entry see Field 1C.
AD-669 665 HC$3.00 MF$0.65

SYSTEM ORGANIZATION FOR ASW SYSTEMS EVALUATION,
Atlantic Fleet Norfolk Va Antisubmarine Warfare Force
For primary bibliographic entry see Field 15A.
AD-669 689 HC$3.00 MF$0.65

SOLUTIONS OF A SPECIAL RECONNAISSANCE GAME
RAND Corp., Santa Monica, Calif.
R. L. Belzer. 10 Aug 49, 24p RM-203

Descriptors: (*War games, Mathematical models), Strategic warfare, Countermeasures, Saddle point method, Performance (Engineering).

In this paper, solutions are given for a special case of a general reconnaissance model previously investigated by S. Sherman. The same notation will be used here in so far as possible. Some examples are given in detail illustrating how the theorems established insure that all of the extreme points of the sets of optimal strategies have been found.
ATI-210 325 HC$3.00

16. MISSILE TECHNOLOGY

16D. Missiles

SUPERSONIC WIND TUNNEL TESTS OF THE THREE-STAGE TARGET MISSILE ARPAT.

Memorandum rept.,
Ballistic Research Labs Aberdeen Proving Ground Md
Joseph M. Hughes. Mar 68, 58p Rept no. BRL-MR-1915

Descriptors: (*Guided missile targets, Supersonic characteristics), Rocket models, Wind tunnel models, Scale, Model tests, Fins, Aerodynamic configurations, Deflection, Moments, Nose cones, Conical bodies, Angle of attack, Roll, Pitch (Motion), Drag, Shock waves, Schlieren photography.
Identifiers: Arpat (Missile), Defender project, Graphs (Charts), Center of pressure.

Wind tunnel tests were performed on a four-percent scale model of the ARPAT Target Vehicle in the Ballistic Research Laboratories' Supersonic Wind Tunnels at Aberdeen Proving Ground, Maryland. Fins of varying area and deflection were tested at Mach numbers of 2.00, 2.50, 3.00 and 4.50. The dynamic roll rate, the pitching moment coefficient, the normal and drag force coefficients, and the center of pressure positions were determined through an angle of attack range. The results are presented and summarized in this report. (Author)
AD-669 588 HC$3.00 MF$0.65

GLOSSARY OF TERMS FOR USE IN ELECTRO-OPTICAL SEEKER/TRACKER TESTING,

Ballistic Research Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 17H.
AD-669 611 HC$3.00 MF$0.65

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

APPLICATION OF THE NEAR-FIELD-ARRAY TECHNIQUE TO SONAR EVALUATION,

Naval Research Lab Orlando Fla Underwater Sound Reference Div
W. James Trott, and Ivor D. Groves. 20 May 68, 33p
NRL-6734

Descriptors: (*Sonar arrays, Reliability), Transducers, Digital computers, Tolerances (Mechanics), Acoustic properties, Sound transmission, Underwater sound, Sonar equipment, Test facilities, Sound generators, Programming (Computers), Sources, Measurement.
Identifiers: Computer aided design, Near field.

The design, construction, and step-by-step tests of the near-field array as developed at this laboratory are described. The optimum design and design tolerances for several arrays have been found by means of a digital computer. A guide for estimating the cost of an array for application to a particular sonar evaluation is derived from experience in the construction of these new arrays. (Author)
AD-669 433 HC$3.00 MF$0.65

A PDP-8 FORTRAN PROGRAM FOR NEAR-FIELD ARRAY TESTING,

Naval Research Lab Orlando Fla Underwater Sound Reference Div
Gerald A. Sabin. 15 May 68, 40p
NRL-6728

Descriptors: (*Sonar arrays, Transducers), (*Transducers, *Computer programs), Sound transmission, Digital computers, Acoustic properties, Interactions, Simulation, Performance (Engineering), Underwater sound, Programming (Computers), Detection, Measurement.
Identifiers: FORTRAN, Near field.

A FORTRAN program has been developed for a small digital computer (PDP-8) to investigate theoretically the effect of irregularities in the positions of transducer elements in an acoustic 'near-field' array. Details of the program are discussed and representative computer runs are presented. (Author)
AD-669 449 HC$3.00 MF$0.65

RADIO, NO. 3, 1966 SELECTED ARTICLES.

Foreign Technology Div Wright-Patterson AFB Ohio
12 Jul 67, 13p Rept no. FTD-HT-23-944-67
Unedited rough draft trans. of Radio, Moscow (USSR) n3 p28-9 1966, by J. Anderson.

Descriptors: (*Television display systems, USSR), Scanning sonar, Sonar equipment, Control systems, Trigger circuits, Wiring diagrams, Television equipment, Lasers, Synchronization (Electronics), Optical scanning, Communication equipment, Pulse systems, Oscillators.
Identifiers: Translations, Interlaced scanning.

Automatic frame scan control (AFSC) prevents pairing of lines, a frequent and undesirable phenomenon, which reduces vertical sharpness of definition and creates a flicker tiring to the viewer. AFSC also eliminates pulling and jumping of the frame. A circuit designed by the author to include AFSC is included and described in detail. The author suggests a method to improved interlacing stability by changing the integrating network in such a manner that suppression of line sync pulses and the shaping of frame sync pulses are separated. A schematic for such a circuit is given. (Author)
AD-669 520 HC$3.00 MF$0.65

17B. Communications

STUDY OF DISTORTION IN KLYSTRONS AND TRAVELINGWAVE TUBES.

Watkins-Johnson Co., Palo Alto, Calif.
For primary bibliographic entry see Field 9E.
AD-446 426 HC$3.00

RODENT RESISTANT CABLE MATERIALS.

Quarterly rept. no. 3, 1 Oct 66-30 Jun 67.
Army Natick Labs Mass Applied Entomology Group
Apr 68, 30p

Descriptors: (*Telephone lines, Protective treatments), Electric insulation, Rodenticides, Effectiveness, Protection, Sprays, Viscosity, Damage assessment, Environmental tests, Deterioration, Handling, Nylon, Metalorganic compounds, Tin compounds, Chlorides, Rubber.
Identifiers: *Rodent repellents, Protective coatings, Tributyltin chloride.

After completed studies on hand coating of WF-16 telephone wire with formulations of tributylin chloride (TBTCl) in chlorinated rubber, a method for machine coating was developed. The wire was sprayed with formulation while passing thru a chamber, then was dried in 20-foot vertical ovens and wound onto take-up reels. Speed of the wire through the system, number of spray applications, viscosity of formulation and drying time were adjusted to obtain the desired rates of application and physical properties of the coating. Field studies in New Mexico, Arizona, Massachusetts, and Panama Canal Zone show significant losses of TBTCl from air-dried coatings during 6 months' exposure, but low losses from oven-dried coatings during 4 months' exposure. Effectiveness of TBTCl in reducing rodent and other animal damage to WF-16 wire is yet undetermined because damage to untreated wire is insufficiently extensive. The New Mexico tests have a trend toward good effectiveness of 25 mg. of TBTCl per square inch of wire surface. A new and rapid laboratory method was developed for evaluating resistance of cables and repellents applied to them, to rodent attack. Electrical tests indicated that repellent coating produced no significant deterioration of electrical characteristics of WF-16 wire. In handling tests, it was determined that gloves were needed while working with the wire because of some skin irritation. The use of TBTCl formulations on electrical wire and cable was approved by The Surgeon General provided gloves are worn during handling and hands are washed after handling. (Author)
AD-669 234 HC$3.00 MF$0.65

CHANNEL SIMULATION-DIGITAL VS. ANALOG.

Institute for Telecommunication Sciences Boulder Colo
For primary bibliographic entry see Field 20N.
AD-669 283 MF$0.65

FUNDAMENTALS OF DATA TRANSMISSION VIA WIRE COMMUNICATIONS CHANNELS,

Foreign Technology Div Wright-Patterson AFB Ohio
V. S. Gurov, G. A. Emelyanov, N. N. Etrukhin, and E. V. Bazilevich. 17 Nov 67, 410p* Rept no. FTD-HT-23-811-67
Unedited rough draft trans. of mono. Osnovy Peredachi Dannykh Po Provodnym Kanalam Svyazi, Moscow, 1964 p1-311.

Descriptors: (*Data transmission systems, *Communication systems), Pulse code modulation, Distortion, Transmission lines, Coding, USSR, Textbooks, Telephone communication systems, Telegraph systems.
Identifiers: Schematics, Translations.

This book is a textbook for students at electrical-engineering communications institutes. It may be of use also to engineers and technicians specializing in the field of data transmission. The fundamentals of the theory of transmitting pulsed signals along communications channels, the fundamentals of protecting the coding of transmitted information against interference, and information concerning the construction of data-transmission channels and circuits are presented. (Author)
AD-669 304 HC$3.00 MF$0.65

TELEVISED OMBUDSMAN,

Rand Corp Santa Monica Calif
Kathleen Archibald, and Ben Bagdikian. May 68, 11p Rept no. P-3841
Presented at the Texas-Stanford Television Conference, Asilomar, California, May 5 1968.

Descriptors: (*Social communication, *Television communication systems), Television stations, Urban areas, Public opinion, Political science, Population, Culture, Interactions.
Identifiers: Ombudsman, Ghettos.

Newspaper 'action line' features and radio talk shows have been growing in popularity in recent months. Several state governments have set up or are thinking of setting up ombudsman offices to provide individuals with a channel for specific complaints about the 'system.' We think there is a role for television as well in this field. This report discusses the possibilities of setting up a televised ombudsman program. An ombudsman program would permit people in poverty areas to make complaints about specific conditions. These would be broadcast, either live or delayed. The program would also confront the responsible parties, usually a municipal or state agency, a retail establishment, or a landlord, and request action on these specific complaints. We assume that telecasting valid complaints from poverty area residents can produce results by the force of publicity. (Author)
AD-669 319 HC$3.00 MF$0.65

FIELD TEST RESULTS OF THE ANDEFT/SC-320 4800,

Mitre Corp Bedford Mass
For primary bibliographic entry see Field 17B.
AD-669 324 HC$3.00 MF$0.65

FIELD TEST RESULTS OF THE ANDEFT/SC-320 4800,
Mitre Corp Bedford Mass
Maurice P. Talbot, Jr. Apr 68, 43p Rept no. MTR-565
ESD-TR-68-117
Contract AF 19(628)-5165

Descriptors: (*Data transmission systems, Radio communication systems), (*Radio communication systems, *Ionospheric propagation), High frequency, Performance (Engineering), Errors, Multipath transmission.
Identifiers: Modems, Digital communication systems, Frequency diversity.

During June 1967, digital transmission tests were conducted on a High-Frequency radio circuit. The HF modem tested was the ANDEFT/SC-320 which was designed by General Dynamics/Electronics Division for data transmission at rates of 4800 b/s in a 3 KHz bandwidth. The test results demonstrate that this modem which operates at twice the data rate of current HF modems has comparable bit error rate performance. (Author)
AD-669 324 HC$3.00 MF$0.65

THE DEVELOPMENT OF PSYCHOLOGICAL MODELS FOR SPEECH RECOGNITION.
Massachusetts Inst of Tech Cambridge Dept of Psychology
For primary bibliographic entry see Field 5G.
AD-669 360 HC$3.00 MF$0.65

RADIO PROPAGATION OVER THE SEA IN THE 2-TO-10-MHZ RANGE.
Naval Electronics Lab Center for Command Control and Communications San Diego Calif
For primary bibliographic entry see Field 20N.
AD-669 442 HC$3.00 MF$0.65

OMEGA SYSTEM SYNCHRONIZATION.
Research rept. Jun-Jul 67,
Naval Electronics Lab Center for Command Control and Communications San Diego Calif
C. P. Kugel. 10 Jan 68, 21p Rept no. NELC-1529

Descriptors: (*Time signals, *Synchronization (Electronics)), Networks, Frequency, Standards, Radio signals, Errors, Very low frequency, Propagation, Accuracy, Atomic clocks, Cesium, Radio stations, Naval shore establishments.
Identifiers: *Omega navigation system.

Data collected by the U. S. Naval Observatory in the spring of 1967 shows (a) that the Omega 3-station network was synchronized to within 2 microsec during the period of observation, and (b) that the Omega system is capable of disseminating time and frequency around the globe with an accuracy sufficient for most users. (Author)
AD-669 444 HC$3.00 MF$0.65

THE DEVELOPMENT OF A DIGITAL HELIUM SPEECH PROCESSOR.
Final rept. May 67-May 68,
HRB-Singer Inc State College Pa
J. B. Wible. May 68, 59p Rept no. HRB-4007-F-2
Contract N00014-66-C-0228

Descriptors: (*Speech, Intelligibility), Speech transmission, Processing, Helium, Underwater communication systems, Distortion, Digital systems, Real time.

The report describes a development program for a small laboratory processor of speech generated in a hyperbaric helium environment. Prior research shows that distortion associated with this helium speech arises from upward shifted format frequencies and a decreasing consonant-vowel ratio. These two factors form the basis for the design of the processor which operates in real time using digital techniques. Test and evaluation of the portable processor and associated microphones followed the developmental phase. Improved intelligibility of helium speech was observed with the use of the processor under various combinations of speaker, microphone, and hyperbaric helium atmosphere. (Author)
AD-669 469 HC$3.00 MF$0.65

RADIO, NO. 3, 1966 SELECTED ARTICLES.
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 17A.
AD-669 520 HC$3.00 MF$0.65

RESEARCH POSSIBILITIES IN PHONETICS,
California Univ Los Angeles
For primary bibliographic entry see Field 5G.
AD-669 543 Not available from CFSTI.

THE NEW COMMUNICATION TECHNOLOGY AND FOR WHAT,
Rand Corp Santa Monica Calif
H. S. Dordick. May 68, 25p Rept no. P-3847

Descriptors: (*Communication systems, Predictions), Television communication systems, Synchronous satellites, Radio communication systems, Cost effectiveness, Information retrieval, Education, Recording systems, Sociology, Symposia.

This paper examines the new technology in communications. It focuses on the uses of and accessibility to satellite and other advanced communication devices. Communication capacity is expanding at a very rapid rate. Transmission capacity throughout the world over the next several years will expand by a factor of at least 5 and possibly 10. The demand for broadcast as well as point-to-point communication services is expanding not only in numbers but in variety. The limited number of mass markets of the past is giving way to large numbers of specialized consumer markets. We are moving from an era of the captive audience to a new era of consumer sovereignty. (Author)
AD-669 556 HC$3.00 MF$0.65

VERTICAL-INCIDENCE IONOSPHERIC DATA: THAILAND.
Ionospheric data rept. Apr 66-Mar 67,
Stanford Research Inst Menlo Park Calif
Bernadine E. Frank, and George H. Hagn. Dec 67, 505p
Contract DA-36-039-AMC-00040 (E), ARPA Order-371

Descriptors: (*Atmospheric sounding, *Thailand), Radio transmission, Site selection, Periodic variations, Very high frequency, High frequency, Diurnal variations, Antenna arrays, Maps, Accuracy, Tables.
Identifiers: SEACORE (Southeast Asia Communications Research), Southeast Asia communications research.

The Granger Model 911 ionospheric sounder systems were operated during 1966 and 1967 at six sites in Thailand ranging between about 7 and 19 degrees North geographic latitude (geomagnetic field dip angles from 5 degrees S to 20 degrees N). This report presents the results from scaling the vertical-incidence ionograms obtained for foF2, h'F2, foF1, h'F1, foEs, h'Es, and percentage of occurrence of Es and spread F. A comparison is made between foF2 values scaled from the Bangkok C-2/3/4 sounder and the Granger sounder for two brief periods--6 April through 7 May 1966, and 1 June through 19 June 1967--when both equipments were operated at the same site. (Author)
AD-669 601 HC$3.00 MF$0.65

TRANSMISSION LOSSES IN A FOREST FOR ANTENNAS CLOSE TO THE GROUND,
Army Electronics Command Fort Monmouth N J
For primary bibliographic entry see Field 20N.
AD-669 608 HC$3.00 MF$0.65

UNUSUAL COMMUNICATIONS TECHNIQUES.
Final rept.,
Stanford Research Inst Menlo Park Calif
Elmer Baum, and Albert J. Mandelbaum. Feb 68, 74p
OCD-2223A

Descriptors: (*Civil defense systems, *Communication systems), Networks, Seismic waves, Acoustic detectors, Signal lights, Wave transmission, Waveguide circulators, Radio transmission, Radio relay stations, Rockets, Vehicles, Surface propulsion, Pneumatic systems, Economics, Feasibility studies.

A review and evaluation is made of unusual communications techniques and unusual applications of conventional communications techniques for civil defense purposes, to identify those that offer the best potential for supporting civil defense requirements. Included in the report are general civil defense operational communications requirements at the federal, state, and local levels, as well as the operational parameters and criteria for evaluating the technical feasibility of candidate techniques. The estimated duration, effort, and funding for the practical development of the recommended techniques are given. (Author)
AD-669 635 HC$3.00 MF$0.65

ELECTROMYOGRAPHIC RESEARCH ON SPEECH SOUNDS,
Joint Publications Research Service, Washington, D. C.
For primary bibliographic entry see Field 6E.
JPRS-44331 HC$3.00 MF$0.65

ON THE SOLUTION OF THE INTEGRAL EQUATION RELATING HEIGHT DISTRIBUTION OF ELECTRON DENSITY TO RADIO WAVE ABSORPTION.
Kiruna Geophysical Observatory (Sweden).
For primary bibliographic entry see Field 20N.
For abstract, see STAR 06 12.
N68-21846 HC$3.00 MF$0.65

VLF SIGNAL PHASE INSTABILITIES PRODUCED BY PROPAGATION MEDIUM - EXPERIMENTAL RESULTS.
Kiruna Geophysical Observatory (Sweden).
For primary bibliographic entry see Field 20N.
For abstract, see STAR 06 12.
N68-21847 HC$3.00 MF$0.65

CONTINUOUS MEASUREMENTS OF THE FARADAY EFFECT USING CROSSED ANTENNAE.
Kiruna Geophysical Observatory (Sweden).
For primary bibliographic entry see Field 9F.
For abstract, see STAR 06 12.
N68-21870 HC$3.00 MF$0.65

OPTICAL AND MICROWAVE COMMUNICATIONS - A COMPARISON.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
F. Kalil. May 68, 46p NASA-TN-D-3984
Contract 125-21-02-17-51

Descriptors: *Mars environment, *Microwave transmission, *Millimeter waves, *Optical communication, *Unmanned spacecraft, Lasers, Performance prediction, Space communication.

For abstract, see STAR 06 12.
N68-22019 HC$3.00 MF$0.65

17E. Infrared and Ultraviolet Detection

THE ROLE OF PROJECT HISTORIES IN THE STUDY OF R AND D,
RAND Corp., Santa Monica, Calif.
For primary bibliographic entry see Field 5B.
AD-458 062 HC$3.00

FURTHER DEVELOPMENT OF ULTRAVIOLET DOSIMETRY BY PLASTICS.
Final rept.,
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
Han Neuberger, and Lee C. Berry. 31 Mar 67, 49p
Grant Cwb-WBG-46

Descriptors: (*Meteorological instruments, Ultraviolet detectors), (*Ultraviolet detectors, Plastics), Acrylic resins, Dosimeters, Sensors, Calibration, Thermal properties, Response, Test equipment.

The purpose of the study was to continue an investigation by Neuberger and Cochran into the use of Plexiglas for inexpensive ultraviolet dosimetry of global irradiance. Specifically, there were three objectives: Recalibration of the sensor; determination of a numerical factor that would correct for the observed effect of temperature on the sensor without resort to exposure on a hot plate; and construction of an instrument to measure the response of the sensor to UV more inexpensively than was done in the previously mentioned study. (Author)
PB-177 734 HC$3.00 MF$0.65

17G. Navigation and Guidance

RENDEZVOUS ACCURACY OF THE OMEGA NAVIGATION SYSTEM,
Naval Research Lab., Washington, D. C.
J. W. Brogden, A. N. Duckworth, and J. J. O'Neill, 17 Nov 64, 17p NRL-MR-1573

Descriptors: (*Radio navigation, Errors), Very low frequency, Ranges (Distance), Performance (Engineering), Propagation, Helicopters, Cargo vehicles, Automatic gain control, Radio receivers, Antennas.
Identifiers: Omega.

Omega is a long-range, very-low-frequency radionavigation system with capabilities of providing a fix with an uncertainty of one mile or less at ranges of 5000 miles from the transmitting stations. The variations in propagation velocities of the signals over a particular path are the major cause of the errors. If the system is used as a rendezvous aigy the propagation errors will cancel out. Thus, the rendezvous accuracy will be greater than the absolute accuracy. The object of this investigation was to determine the rendezvous accuracy of a helicopter and a truck in various surroundings by use of Omega. The forestport-summit transmissions demonstrate that the system could be used as a rendezvous aid with accuracies of around 200 yards, with the time of day or environment having no apparent effect on the rendezvous errors. (Author)
AD-453 921 HC$3.00

THE DESIGN AND BUILD OF A GAS BEARING GYROSCOPE POSSESSING HIGH G AND STERILIZATION CAPABILITY AND UTILIZING A LOW POWER GAS BEARING SPINMOTOR AND HIGH FREQUENCY PUMP QUARTERLY PROGRESS REPORT, 1 JAN. - 31 MAR. 1968.
Honeywell, Inc., Minneapolis, Minn. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Aerospace Div.
G. J. Erickson. 31 Mar 68, 20p NASA-CR-94242, REPT.-20660-QR5
Contracts NAS7-100, JPL-951559
Prep- Prepared for Jpl

Descriptors: *Gas bearings, *Gimbals, *Gyroscopes, Chemical analysis, Contamination, Humidity, Performance tests, Piezoelectricity, Pumps, Sterilization.

For abstract, see STAR 06 12.
N68-21884 HC$3.00 MF$0.65

STERILIZABLE WIDE ANGLE GAS BEARING GYRO FGG334S QUARTERLY PROGRESS REPORT, 1 JAN. - 1 APR. 1968.
Honeywell, Inc., Minneapolis, Minn. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Aerospace Div.
D. R. White. 15 Apr 68, 22p NASA-CR-94240, REPT.-20584-QR6
Contracts NAS7-100, JPL-951529
Prep- Prepared for Jpl

Descriptors: *Gas bearings, *Gyroscopes, *Systems engineering, Contamination, Gas chromatography, Infrared spectroscopy, Moisture, Spectroscopic analysis, Stators.

For abstract, see STAR 06 12.
N68-21911 HC$3.00 MF$0.65

GROUND PRINCIPLE OF SUBOPTIMAL PERTURBATIONAL GUIDANCE SYSTEM AND POLYNOMIAL APPROXIMATION OF GUIDANCE MATRICES.
Principes Du Guidage Perturbationnel Suboptimal Et Methodes Diapproximation Polynomiale des Matrices de Guidage
Manufacture Belge de Lampes Et de Materiel Electronique, Brussels (Belgium).
Y. Genin. 1966, 17p
Lang- in French Seri- Its Mble Rev., Vol. 9, No. 2

Descriptors: *Linearization, *Mathematical models, *Optimal control, *Spacecraft guidance, Chebyshev approximation, Equations of motion, Error correcting devices, Matrices (mathematics), Maximum principle, Perturbation, Polynomials, Time dependence.

For abstract, see STAR 06 12.
N68-22273 HC$3.00 MF$0.65

STUDY OF BROAD-BAND AMPLITUDE-COMPARISON METHODS FOR ACCURATE MICROWAVE DIRECTION FINDING IN A SECTOR.
Royal Aircraft Establishment, Farnborough (England).
N. A. Pavey. Oct 67, 48p RAE-TR-67271

Descriptors: *Amplitudes, *Antenna radiation patterns, *Bearing (direction), *Broadband, *Microwave antennas, *Radio direction finders, Bandwidth, Comparison, Data processing, Directional antennas, Errors, Multichannel communication, Signal to noise ratios, Thermal noise, Video equipment.

For abstract, see STAR 06 12.
N68-22281 HC$3.00 MF$0.65

17H. Optical Detection

GLOSSARY OF TERMS FOR USE IN ELECTRO-OPTICAL SEEKER/TRACKER TESTING,
Ballistic Research Labs Aberdeen Proving Ground Md
A. E. LaGrange. Feb 68, 29p Rept no. BRL-TN-1687

Descriptors: (*Optical tracking, Dictionaries), (*Guided missiles (Air-to-air), Guidance), Electrooptics, Guided missile tracking systems, Radiometers, Photometers, Noise.

This report contains a glossary of electro-optical terms for use in laboratory and field testing of missiles and weapon systems. Appendices containing selected handbook information applicable to electro-optical seeker testing are also included. The material for this report was prepared by a tri-service working group comprised of members of the Sub-Study Group on Electro-Optical Seekers (SSG-EOS) which is connected with the Joint Technical Coordinating Group for Air-Launched Non-Nuclear Ordnance (JTCG-ALNNO). (Author)
AD-669 611 HC$3.00 MF$0.65

KINETHEODOLITE OBSERVATIONS MADE AT EARLYBURN SATELLITE 1965-35 B, JANUARY TO MARCH 1966.
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
12 Sep 67, 12p ROE-STS-63

Descriptors: *Cinetheodolites, *Cosmos satellites, *Rocket launchers, Azimuth, Elevation, Elliptical orbits, Optical tracking, Photographic measurement.

For abstract, see STAR 06 12.
N68-21929 HC$3.00 MF$0.65

KINETHEODOLITE OBSERVATIONS MADE AT EARLYBURN SATELLITE 1962 BETA- TAU 6, OCTOBER 1965 TO MARCH 1966.
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
4 Aug 67, 40p ROE-STS-62

Descriptors: *Cinetheodolites, *Injun 3 satellite, Agena d rocket vehicle, Azimuth, Elevation, Elliptical orbits, Optical tracking, Photographic measurement.

For abstract, see STAR 06 12.
N68-21930 HC$3.00 MF$0.65

A LIGHT-WEIGHT OPTICAL REFRACTOMETER FOR FIELD USE.
Weapons Research Establishment, Salisbury (Australia).
M. S. Brown. Nov 67, 23p WRE-TN-ISD-89

Descriptors: *Refractivity, *Refractometers, *Theodolites, Atmospheric pressure, Atmospheric refraction, Interferometers, Temperature gradients.

For abstract, see STAR 06 12.
N68-22852 HC$3.00 MF$0.65

PRELIMINARY RESULTS OF TRIALS TO DETERMINE THE MAXIMUM RANGE OF PERCEPTION OF FAST AIRCRAFT.
Royal Radar Establishment, Malvern (England).
H. E. Hoffman. Apr 67, 10p RRE-TRANS-171, TIL/OT/8641
Tran- Transl. Into English From German

Descriptors: *Supersonic aircraft, *Visual perception, Graphs (charts), Visibility, Visual observation.

For abstract, see STAR 06 12.
N68-23016 HC$3.00 MF$0.65

17I. Radar Detection

STRUCTURE AND FOUNDATION BEHAVIOR DURING ANTENNA OPERATION, TAA-2A VERO BEACH, FLORIDA, AND TAA-3 MERRITT ISLAND, FLORIDA,
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 8M.
AD-669 239 HC$3.00 MF$0.65

MODELS FOR ANALYSIS OF THE CAPABILITIES OF GROUND BASED SENSORS IN DETERMINING THE MASS OF ORBITING BODIES,

Westinghouse Defense and Space Center Baltimore Md Surface Div
For primary bibliographic entry see Field 22C.
AD-669 359 HC$3.00 MF$0.65

A GEOMETRICAL THEORY OF DIFFRACTION ANALYSIS OF THE RADAR CROSS SECTION OF A SECTIONALLY CONTINUOUS SECOND-DEGREE SURFACE OF REVOLUTION.
Quarterly rept. 1 Jan-31 Mar 68,
Ohio State Univ Columbus Electroscience Lab
Charles E. Ryan. Mar 68, 196p Rept no. 2430-4
ESD-TR-68-211
Contract F19628-67-C-0308
See also AD-667 799.

Descriptors: (*Radar echo areas, Scattering), (*Programming (Computers), Radar echo areas), (*Antiaircraft defense systems, Radar tracking), Bodies of revolution, Cylindrical bodies, Geometry, Diffraction, Spheres, Backscattering, Attenuation, Radar targets, Optical properties, Mathematical analysis, Computer programs, Theory, Flow charting, Target acquisition, Aerial targets.

The radar cross section of a continuous, convex, body of revolution composed of N sections, each section described by a second-degree equation has been analyzed using the geometrical theory of diffraction. Wedge diffraction has been applied to determine the scattered field due to discontinuities in slope between sections of the target, and creeping wave theory has been applied to determine the scattered field due to propagation of energy around the target. A solution for the diffracted field on an axial caustic is presented. An approximate solution for the scattered field near and at the normal direction to a conical generator is developed. A 'simplified ray path geometry' for the creeping wave is presented and related to the scattering by spheres and prolate spheroids. The H-plane field of the sphere is calculated using creeping wave techniques for a ray geometry defined by the Poynting vector at the shadow boundary. The approximate creeping wave solution for the edge-on backscattering of disks is developed and applied to ogival, circular and elliptical disks. The above techniques have been assembled into two computer programs for automatic computation of the radar cross section. These programs have been tested for cones, double cones, cylinders, conically capped cylinders, spheroids, and various prolate spheroid-sphere and prolate spheroid-oblate spheroid combination targets. (Author)
AD-669 372 HC$3.00 MF$0.65

AN/GPA-123 SUM AND DIFFERENCE ANTENNA GROUP.
Rome Air Development Center Griffiss AFB N Y
For primary bibliographic entry see Field 9E.
AD-669 386 HC$3.00 MF$0.65

METHODS OF ANALYSIS OF SEISMIC DATA. APPENDIX I; RADAR AND SEISMIC SIGNAL DETECTION. APPENDIX II; THE ISOTROPIC MODEL OF MICROSEISMS. APPENDIX III; SOME NEW RESULTS IN SPECTRAL ESTIMATION.
Uppsala Univ (Sweden) Seismological Inst
For primary bibliographic entry see Field 8K.
AD-669 511 Not available from CFSTI.

INERTIALESS POLARIZATION SCANNERS.
Technical rept. (Final) 14 Feb-30 Sep 67,
Georgia Inst of Tech Atlanta Engineering Experiment Station
M. E. Wallace, G. W. Ewell, and L. A. Stapleton. Apr 68, 60p
Contract DAAH01-67-C-1438

Descriptors: (*Radar antennas, Polarization), Scanning, X band, Phase shifters, Transducers, Reflectors, Antenna feeds, Antenna radiation patterns, Gain, Rotation, Power dividers.

The report discusses the principles of operation, the design, and the performance of a pair of X-band polarization-agile radar antennas, one for transmitting and one for receiving. These antennas are compatible with an existing pulse-Doppler radar and utilize front-fed 4-foot paraboloidal reflectors. The direction of linear polarization of these antennas can be rotated in digital increments on a pulse-to-pulse basis at prf's as high as 50 KHz. An electronic programmer permits the manual selection of any one of 32 polarization directions or the automatic sequencing of the available polarization directions in a variety of operational modes. A change in polarization is accomplished in less than two microseconds and the total insertion loss of each complete antenna is less than 1.0 dB. The antennas track within 7 degrees for all polarization directions with polarization purity greater than 23 dB for frequencies between 9.8 and 10.25 GHz. The gain, VSWR, and antenna patterns of the polarization-agile antennas are comparable to single-polarization antennas of the same size. (Author)
AD-669 670 HC$3.00 MF$0.65

FLIGHT TESTS OF A RADAR SCATTERING-COEFFICIENT MEASURING INSTRUMENT. PART 1 - SUMMARY.
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
For primary bibliographic entry see Field 9F.
For abstract, see STAR 06 12.
N68-21892 HC$3.00 MF$0.65

MODULO ACQUISITION OF AMBIGUITY RESOLVING TRACKING CODES
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
S. Levine. Mar 68, 5p NASA-TM-X-63167, X-531-68-112

Descriptors: *Data acquisition, *Range and range rate tracking, *Signal encoding, Ambiguity, Pseudorandom sequences, Spacecraft tracking.

For abstract, see STAR 06 12.
N68-21921 HC$3.00 MF$0.65

A STUDY OF EARTH RADAR RETURNS FROM ALOUETTE SATELLITE.
Kansas Univ., Lawrence. Remote Sensing Lab.
For primary bibliographic entry see Field 9F.
For abstract, see STAR 06 12.
N68-22044 HC$3.00 MF$0.65

ON RADAR AMBIGUITY FUNCTIONS INCLUDING ANGLE AND ANGLE-RATE.
Royal Aircraft Establishment, Farnborough (England).
P. W. James. Oct 67, 25p RAE-TR-67266

Descriptors: *Ambiguity, *Angles (geometry), *Radar transmission, *Range and range rate tracking, Doppler effect, Radar resolution, Rates (per time), Signal analysis.

For abstract, see STAR 06 12.
N68-22280 HC$3.00 MF$0.65

17J. Seismic Detection

STUDY OF SHORT-PERIOD SEISMIC NOISE.
Geotech, Garland, Tex.
For primary bibliographic entry see Field 8K.
AD-416 127 HC$3.00

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

REPORT OF AD HOC PANEL ON LOW-BETA TOROIDAL PLASMA RESEARCH.
Ad Hoc Panel on Low-Beta Toroidal Plasma Research.
Sep 67, 121p*

Descriptors: (*Plasma medium, Containment), (*Thermonuclear reactions, Containment), Magnetohydrodynamics, Superconductivity.

For abstract, see NSA 22 10.
TID-24228 HC$3.00 MF$0.65

18B. Isotopes

MOUND LABORATORY PROGRESS REPORT FOR CHEMISTRY, APRIL-JUNE 1967.
Mound Lab., Miamisburg, Ohio.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 22 10.
MLM-1417 HC$3.00 MF$0.65

TRITIUM. MEANS OF DETECTION AND OF PROTECTION.
Commissariat A L Energie Atomique, Chusclan (France). Centre de Production de Plutonium de Marcoule.
Y. Sutra-fourcade. Dec 67, 104p CEA-R-3350
Lang- in French, English Summary

Descriptors: *Radiation dosage, *Radiation protection, *Radiobiology, *Tritium, Atmospheric radiation, Decontamination, Dosimeters, Radiation counters, Radiation hazards.

For abstract, see STAR 06 12.
N68-22876 HC$3.00 MF$0.65

LIST OF AEC RADIOISOTOPE CUSTOMERS WITH SUMMARY OF RADIOISOTOPE SHIPMENTS, FY 1967,
Oak Ridge National Lab., Tenn.
Ruth Curl. Mar 68, 40p*
Contract W-7405-eng-26

Descriptors: (*Radioactive isotopes, Distribution), Reviews, Tables.

For abstract, see NSA 22 10.
ORNL-IIC-13 HC$3.00 MF$0.65

18C. Nuclear Explosions

A CATALOGUE OF METEOROLOGICAL DATA OBTAINED DURING THE LINE ISLANDS EXPERIMENT FEBRUARY-APRIL 1967,
National Center for Atmospheric Research Boulder Colo
For primary bibliographic entry see Field 4B.
AD-669 284 HC$3.00 MF$0.65

ANALYSIS OF GROUND MOTION AND CONTAINMENT,
Environmental Research Corp Alexandria Va
Lawrence L. Davis. 26 Jan 68, 115p
ARPA-VUF-1035
Contract AT (29-2)-1163
Rept. on VELA Uniform Program, Proj. STERLING EVENT.

Descriptors: (*Underground explosions, Microseisms), Nuclear explosions, Stratigraphy, Velocity, Deformation, Physical properties, Seismological stations, Predictions, Deposits, Salts, Acceleration, Structural geology, Particles, Equations of motion, Attenuation, Cracks, Sedimentary rock.
Identifiers: Decoupling, Holes (Cavities), Sterling shot, Vela-Uniform, Yield.

The pre-shot predictions and evaluations of ground motion, stemming and containment are presented and compared with the available observed data. The analysis of seismic data included corrections for frequency response of the instruments, derivation of nonrecorded motions by differentia-

tion and integration, and filtering of the seismic signals to derive amplitude-frequency relationships. Observed ground motions were lower than expected from a coupled (fully tamped) explosion of equal size. The peak accelerations and velocities displayed high rates of attenuation compared to Salmon. Relatively small azimuthal variations were observed. Peak motions were associated with frequencies between 3 and 80 hz. A noticeable decrease in frequency with increasing distance was observed. (Author)
AD-669 483 HC$3.00 MF$0.65

PRESHOT AND POSTSHOT SAFETY SURVEY OF OIL AND GAS FACILITIES BAXTERVILLE FIELD MISSISSIPPI,
Bureau of Mines Bartlesville Okla
Don C. Ward. Jan 67, 79p
ARPA-VUF-1041
Rept. on VELA UNIFORM PROGRAM: Sterling Event.

Descriptors: (*Underground explosions, Petroleum industry), (*Petroleum industry, *Nuclear explosion damage), Nuclear explosions, Detection, Test facilities, Natural resources, Gases, Nuclear explosion damage, Site selection, Pipes, Visual inspection, Maps, Physical properties, Mississippi, Photographic analysis.
Identifiers: Vela-Uniform, Sterling Shot, Oil wells.

The survey was conducted in accordance with the Operational Safety Plan for the Sterling Event, dated November 1966. Oil and gas wells and related facilities of the Baxterville field were surveyed to document any physical changes resulting from the Sterling Event. All such structures within a 5-mile radius of Ground Zero (GZ) were examined and photographed in detail. Other selected wells and facilities within a 6-mile radius of GZ were examined and photographed. (Author)
AD-669 484 HC$3.00 MF$0.65

SOIL SURVEY AND SUPPORT ACTIVITIES OPERATION DISTANT PLAIN EVENT 6.
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 8M.
AD-669 616 HC$3.00 MF$0.65

GASBUGGY PRELIMINARY POSTSHOT SUMMARY REPORT,
California Univ., Livermore. Lawrence Radiation Lab.
Fred Holzer. Jan 68, 19p* UCRL-50386
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, Underground explosions), (*Nuclear industrial applications, *Petroleum industry), Well logging, Shock waves, Fracture (Mechanics), Gas flow, Radioactivity.
Identifiers: Plowshare operation, Gasbuggy shot.

For abstract, see NSA 22 10.
PNE-1003 HC$3.00 MF$0.65

CALCULATION OF FREE-FIELD MOTION FOR THE PILEDRIVER EVENT,
California Univ., Livermore. Lawrence Radiation Lab.
J. T. Cherry, and E. G. Rapp. 2 Feb 68, 9p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, Shock waves), (*Underground explosions, Nuclear explosions), Equations of state, Granite, High-pressure research, Thermal stresses, Motion.
Identifiers: Plowshare operation, Piledriver shot, Yield, Sizes (Dimensions), Ground motion.

For abstract, see NSA 22 10.
UCRL-50373 HC$3.00 MF$0.65

18D. Nuclear Instrumentation

TEMPERATURE CORRECTIONS IN FALLING PARTICLE-MOLECULAR BEAM EXPERIMENTS,
Goucher Coll Towson Md
For primary bibliographic entry see Field 14B.
AD-669 236 HC$3.00 MF$0.65

A HIGH-SENSITIVITY NEUTRON AND GAMMA-RADIATION RADIOMETER OF THE VRNG-2 TYPE (VYSOKOCHUVSTVITELNYI RADIOMETR NEITRONOV I GAMMA-IZLUCHENIYA TIPA VRNG-2),
Foreign Technology Div Wright-Patterson AFB Ohio
L. S. Druskina, V. I. Krasnenkov, and T. V. Timofeeva. 27 Oct 67, 11p Rept no. FTD-HT-23-856-67
Edited trans. of Radiatsionnaya Fizika (Latvian SSR) v2 p79-86 1964, by F. Dion.

Descriptors: (*Neutron counters, Design), (*Gamma counters, Design), Scintillation counters, Semiconductor devices, Zinc sulfides, Impurities, Gold, Boric acids, Sensitivity, USSR.
Identifiers: Translations.

A universal radiometer for fast, intermediate, and slow n and gamma-radiation is described; it can measure fast-n fluxes in the range 0.03 - 3000 n/sq cm sec. and gamma-radiation in the range of 0.05 - 800 micro-r/sec with relatively high accuracy. The n detector is a ZnS (Ag) scintillator with H3BO3 added (85% 10B). It can be equipped with an organic glass moderator (in the case of fast n) and Cd shield. Gamma-radiation is detected by using a standard gamma-counter. (Author)
AD-669 316 HC$3.00 MF$0.65

A SYSTEM FOR IDENTIFYING CHANNELS OF A PULSE ANALYZER MEMORY DATA DISPLAY.
Illinois Univ Urbana Dept of Physics
For primary bibliographic entry see Field 9E.
AD-669 495 HC$3.00 MF$0.65

SUMMARY REVIEW OF FLOWMETERS SUITABLE FOR MEASURING SODIUM FLOW AT TEMPERATURES UP TO 1200 DEGREES F IN THE FAST FLUX TEST FACILITY (FFTF),
Argonne National Lab., Ill.
G. F. Popper, D. E. Wiegand, and M. C. Glass. Dec 67, 32p
Contract W-31-109-eng-38

Descriptors: (*Flowmeters, Liquid metals), (*Liquid metal coolants, Flowmeters), Sodium, Reviews, Test facilities, Reactor materials, Magnets, Turbines, Design, High-temperature research.

For abstract, see NSA 22 10.
ANL-7340 HC$3.00 MF$0.65

ANALOG PULSE DIVIDER USING FIELD-EFFECT TRANSISTORS,
Los Alamos Scientific Lab., N. Mex.
H. Dean Sutphin. 2 Jul 67, 8p
Contract W-7405-eng-36

Descriptors: (*Radiation measurement systems, *Logic circuits), Analog systems, Pulse systems, Field effect transistors.
Identifiers: Pulse dividers.

For abstract, see NSA 22 10.
LA-3818 HC$3.00 MF$0.65

MEASURING SYSTEM FOR ACTIVE GASES USING TWO PROPORTIONAL COUNTERS.
Banc de Mesure de Gaz Actifs A Deux Compteurs Proportionnels
Commissariat A L Energie Atomique, Saclay (France).
J. Colomer. Dec 67, 40p CEA-R-3403
Lang- in French

Descriptors: *Beta particles, *Gas analysis, *Proportional counters, *Radiation detectors, Dosimeters, Helium 3, Krypton 85.

For abstract, see STAR 06 12.
N68-22612 HC$3.00 MF$0.65

ENERGY LOSS, RANGE AND STOPPING POWER OF CHARGED PARTICLES IN SILICIUM OR GERMANIUM DETECTORS.
Perte D Energie, Parcours Et Ralentissement des Particules Chargees Dans les Detecteurs Au Silicium Ou Au Germanium
Commissariat A L Energie Atomique, Saclay (France).
J. Picard, and G. Souchere. Oct 67, 24p CEA-R-3371
Lang- in French

Descriptors: *Charged particles, *Particle energy, *Radiation detectors, *Solid state devices, Energy dissipation, Germanium, Particle emission, Radiation counters, Silicon films, Tables (data), Thin films.

For abstract, see STAR 06 12.
N68-22678 HC$3.00 MF$0.65

BEHAVIOUR OF BF3 COUNTERS AFTER IN-PILE IRRADIATION.
Comportement de Compteurs A Bf3 Apres Irradiation Dans Un Reacteur
Commissariat A L Energie Atomique, Saclay (France).
R. Verdant. Dec 67, 30p CEA-R-3343
Lang- in French

Descriptors: *Aluminum, *Beryllium fluorides, *Cathodes, *Neutron irradiation, *Proportional counters, Absorption spectra, Copper, Gamma rays, Nuclear reactors.

For abstract, see STAR 06 12.
N68-22716 HC$3.00

STUDY OF THE TEXTURE OF POROUS SOLIDS USING A TECHNIQUE OF GAMMA RAY ABSORPTION.
Application de L Absorption Du Rayonnement Gamma A L Etude de La Texture des Solides Poreux
Commissariat A L Energie Atomique, Grenoble (France).
M. Ortega. Jan 67, 76p CEA-R-3204
Lang- in French

Descriptors: *Gamma rays, *Measuring instruments, *Porous materials, *Radiation absorption, Density (mass/volume), Heterogeneity, Mercury (metal), Porosity, Textures.

For abstract, see STAR 06 12.
N68-22929 HC$3.00 MF$0.65

MEASUREMENT AND ANALYSIS OF HIGH ENERGY RADIATION THROUGH ACTIVATION DETECTORS. APPLICATION IN DOSIMETRY.
Sur La Mesure Et l'Analyse des Rayonnements de Haute Energie Par Detecteurs A Activation. Application A La Dosimetrie
Commissariat A L Energie Atomique, Saclay (France).
L. Sklavenitis. 1967, 141p CEA-R-3376
Lang- in French, English Summary

Descriptors: *Proton beams, *Radiation detectors, *Radiation effects, Activation energy, Energy spectra, Nuclear reactions, Radiation dosage.

For abstract, see STAR 06 12.
N68-22964 HC$3.00 MF$0.65

DEVELOPMENT OF A SEMICONDUCTOR COUNTER TELESCOPE WITH LOW BACKGROUND FOR THE INVESTIGATIONS OF CHARGED PARTICLES PRODUCED IN REACTIONS INDUCED BY NEUTRONS.

Realisation Et Mise Au Point D'un Telescope A Semi-conducteurs Et A Faible Bruit-de-fond pour l'Etude des Reactions Neutrons-particules Chargees
Commissariat A L Energie Atomique, Grenoble (France). Centre D'etudes Nucleaires.
J.-M. Helleboid. 1967, 148p CEA-R-3378
Lang- in French, English Summary

Descriptors: *Charged particles, *Nuclear reactions, *Particle telescopes, Neutrons, Semiconductors (materials).

For abstract, see STAR 06 12.
N68-22970 HC$3.00 MF$0.65

GERMANIUM JUNCTION DETECTORS. THEORETICAL AND PRACTICAL FACTORS GOVERNING THEIR USE IN RADIATION SPECTROMETRY.
Detecteurs A Jonction Au Germanium. Elements Theoriques Et Pratiques pour l'Utilisation en Spectrometrie de Rayonnements
Commissariat A L Energie Atomique, Saclay (France).
M. Hors, and C. Philis. Nov 67, 89p CEA-R-3251
Lang- in French, English Summary

Descriptors: *Germanium compounds, *Nuclear radiation spectroscopy, *Radiation detectors, *Semiconductor junctions, Alpha particles, Beta particles, Cesium isotopes, Gamma rays, Photoelectricity, Radiochemistry.

For abstract, see STAR 06 12.
N68-22986 HC$3.00 MF$0.65

PAGURE 60 CO PANORAMIC IRRADIATION FACILITY.
Pagure Irradiateur Panoramique A 60co
Commissariat A L Energie Atomique, Saclay (France).
J. Laizier, R. Laroche, M. Lorin, and J. R. Puig. Nov 67, 47p CEA-R-3302
Lang- in French, English Summary

Descriptors: *Cobalt 60, *Irradiation, *Systems engineering, Operations, Radiation shielding, Radiation sources.

For abstract, see STAR 06 12.
N68-22988 HC$3.00 MF$0.65

PREPARATION OF RADIOACTIVE GASEOUS STANDARD.
Preparation des Etalons de Gaz Radioactifs
Commissariat A L Energie Atomique, Saclay (France).
M. Blondel, and X. D. Phan. Dec 67, 34p CEA-R-3365
Lang- in French

Descriptors: *Ampoules, *Gas dynamics, *Radioactive materials, *Weight (mass), Accuracy, Calibrating, Radiation counters, Radiation sources, Standards, Volume.

For abstract, see STAR 06 12.
N68-22989 HC$3.00 MF$0.65

IMPROVEMENTS OF THE SENSITIVITY OF BURST CARTRIDGE DETECTION.
Amelioration Du Sevil de Detection des Ruptures de Gaine
Commissariat A L Energie Atomique, Saclay (France).
F. Vasnier. Dec 67, 28p CEA-R-3330
Lang- in French

Descriptors: Cartridges, Fission products, Gas flow, Performance tests, Perturbation, Power reactors, Radiation detectors, Scintillation counters, Sensitivity, Signal stabilization, Switching circuits.

For abstract, see STAR 06 12.
N68-22990 HC$3.00 MF$0.65

DETERMINATION OF A 14 ME V NEUTRON FLUX BY COPPER ACTIVATION.
Determination D'un Flux de Neutrons de 14 Mev Par Activation Du Cuivre
Commissariat A L Energie Atomique, Saclay (France).
D. Ameline, and A. Bertin. Nov 67, 26p CEA-R-3295
Lang- in French, English Summary

Descriptors: *Activation, *Copper, *Flux (rate), *Neutron emission, Radiation detectors, Radioactive isotopes.

For abstract, see STAR 06 12.
N68-22995 HC$3.00 MF$0.65

MEASUREMENT EQUIPMENT FITTED IN LIGHT VEHICLES USED FOR SUPERVISION AND RECONNAISSANCE BY THE RADIOPROTECTION SERVICE AT CADARACHE.
Equipment de Mesures des Vehicules Legers de Surveillance Et de Reconaissance de La S. P. R. Cadarache
Commissariat A L Energie Atomique, Cadarache (France).
A. Galanti, M. Grandin, and C. Thirion. Dec 67, 36p CEA-R-3324
Lang- in French

Descriptors: *Radiation detectors, *Radiation protection, *Radioactive contaminants, *Reactor safety, Contamination, Fallout, Gamma rays, Radiation dosage, Radiation hazards, Surface vehicles.

For abstract, see STAR 06 12.
N68-23020 HC$3.00

EVALUATION OF A REM RESPONDING NEUTRON DETECTOR FOR USE AROUND THE UNIVERSITY OF ROCHESTER'S 20 MEV EMPEROR TANDEM VAN DE GRAAFF ACCELERATOR.
Rochester Univ., N. Y. Atomic Energy Project.
Bernard R. Gifford, Herbert Mermagen, and H. David Maillie. 9 Feb 68, 25p
Contract W-7405-eng-49

Descriptors: (*Neutron detectors, Performance (Engineering)), Van de Graaff generators, Instrumentation.

For abstract, see NSA 22 10.
UR-49-903 HC$3.00 MF$0.65

18E. Nuclear Power Plants

TECHNICAL, OPERATIONAL AND ECONOMIC REPORT ON THE N. S. SAVANNAH SECOND YEAR OF EXPERIMENTAL COMMERCIAL OPERATION, AUGUST 1966-AUGUST 1967.
Maritime Administration, Washington, D. C. Office of Research and Development.
For primary bibliographic entry see Field 13J.
PB-178 167 HC$3.00 MF$0.65

18F. Radiation Shielding and Protection

APPLICATIONS OF MONTE CARLO ANALYSIS TO TUNGSTEN RESONANCE ABSORPTION.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. M. Westfall. May 68, 47p NASA-TN-D-4545
Contract 129-02-04-03-22

Descriptors: *Absorption spectra, *Monte carlo method, *Resonance, *Tungsten, Neutron sources, Radiation shielding, Resonance scattering.

For abstract, see STAR 06 12.
N68-21924 HC$3.00

TRITIUM. MEANS OF DETECTION AND OF PROTECTION.
Commissariat A L Energie Atomique, Chusclan (France). Centre de Production de Plutonium de Marcoule.
For primary bibliographic entry see Field 18B.
For abstract, see STAR 06 12.
N68-22876 HC$3.00 MF$0.65

NEUTRON MEASUREMENTS AROUND NUCLEAR REACTORS.
United Kingdom Atomic Energy Authority, Harwell (England).
A. K. Burt, and J. W. Leake. Mar 67, 9p AERE-M-1848

Descriptors: *Neutron beams, *Neutron counters, *Nuclear reactors, Gamma rays, Radiation detectors.

For abstract, see STAR 06 12.
N68-22936 HC$3.00 MF$0.65

HYGIENE EFFECTS AND CONTROL OF DUSTS, FOGS, GASES, VAPOURS, RADIOACTIVE PARTICLES.
Israel Program for Scientific Translations, Ltd., Jerusalem.
For primary bibliographic entry see Field 13B.
For abstract, see STAR 06 12.
N68-23025 HC$2.00 MF$0.65

18G. Radioactive Wastes and Fission Products

DOSAGE OF CESIUM 137 IN RADIOACTIVE WASTES BY THE APPLICATION OF SODIUM TETRAPHENILBORATE.
Dosage Du Cesium 137 Dans les Effluents Radioactifs Par le Tetraphenylborate de Sodium
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France).
J. Girault, and G. Testemale. Dec 67, 31p CEA-R-3391
Lang- in French

Descriptors: *Cesium 137, *Extraction, *Radioactive wastes, Borates, Concentrating, Materials recovery, Radiation dosage, Tetraphenyls.

For abstract, see STAR 06 12.
N68-22602 HC$3.00 MF$0.65

HYGIENE EFFECTS AND CONTROL OF DUSTS, FOGS, GASES, VAPOURS, RADIOACTIVE PARTICLES.
Israel Program for Scientific Translations, Ltd., Jerusalem.
For primary bibliographic entry see Field 13B.
For abstract, see STAR 06 12.
N68-22756 HC$2.00 MF$0.65

FISSION PRODUCT ABSORPTION IN THERMAL REACTORS.
Atomic Energy of Canada, Ltd., Chalk River (Ontario). Nuclear Labs.
W. H. Walker. 1966, 17p AECL-2497, CN-23/1

Descriptors: *Fission products, *Material absorption, *Nuclear reactors, Absorption cross sections, Resonance, Thermal neutrons, Yield.

For abstract, see STAR 06 12.
N68-23006 HC$3.00 MF$0.65

A COMPUTER CODE FOR STORING AND RETRIEVING DATA AND DEVELOPING IM-

PROVED SOLIDS FOR FIXATION OF HIGHLY RADIOACTIVE WASTES,
Oak Ridge National Lab., Tenn.
C. L. Fitzgerald, H. W. Godbee, and M. H. Davis.
Mar 68, 27p
Contract W-7405-eng-26

Descriptors: (*Radioactive waste, Storage), (*Programming (Computers), Radioactive waste), Flow charting, Computer programs, Data processing systems, Absorption (Physical), Predictions.
Identifiers: FORTRAN.

For abstract, see NSA 22 10.
ORNL-3824-Suppl-1 HC$3.00 MF$0.65

18H. Radioactivity

A COMPILATION OF ARTICLES REPORTING RESEARCH SPONSORED JOINTLY BY THE U. S. ATOMIC ENERGY COMMISSION AND THE OFFICE OF NAVAL RESEARCH.
Washington Univ Seattle Dept of Oceanography
For primary bibliographic entry see Field 8J.
AD-669 290 Not available from CFSTI.

SPECTRAL MEASUREMENTS OF SCATTERED PHOTONS FROM A POINT SOURCE NEAR THE AIR-GROUND INTERFACE,
Naval Radiological Defense Lab San Francisco Calif
Allen L. Frank. 10 Oct 67, 59p Rept no. USNRDL-TR-67-124

Descriptors: (*Radioactive fallout, Simulation), (*Gamma-ray spectroscopy, Radioactive fallout), Photons, Scattering, Sources, Cesium, Cobalt, Intensity.

A gamma-ray spectroscopy experiment was performed to measure the scattered photons from a point source near the air-ground interface. Source-to-detector radial distances of 9.7 and 20.6 ft. were used for a Cs137 source and 9.7 ft. for a Co60 source. The source height was 8 in. and the detector height was about 3 ft. The measured flux was separated into 10 degree vertical angular bins and the data were reduced to photon spectra by a matrix iteration procedure. Comparisons were made between the measurements and corresponding Monte Carlo calculated spectra. The angular exposures also were compared and the buildup factors were presented along with other buildup data from the literature. (Author)
AD-669 452 HC$3.00 MF$0.65

PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1966 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART I. ATMOSPHERIC SCIENCES,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 4A.
For abstract, see NSA 22 10.
BNWL-481-1-Vol-2-Pt-1 HC$3.00 MF$0.65

ESTIMATION OF RADIATION DOSES FOLLOWING A REACTOR ACCIDENT,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 22 10.
ORNL-4086 HC$3.00 MF$0.65

RADIOACTIVE DECAY CORRECTION FACTORS,
Public Health Service, Washington, D. C. Div. of Radiological Health.
Kenneth H. Falter. Apr 65, 211p*
PHS-999-RH-12

Descriptors: (*Radioactive decay, Tables), Corrections, Tracer studies, Standards, Thorium, Neptunium, Uranium, Actinium, Yttrium, Strontium, Radioactive series, Mathematical analysis, Errors, Radium, Measurement, Radon.

Tables of correction factors for radioactive decay are presented for calculating the activity of a radioactive nuclide at a given time, given its activity at any other time. (Author)
PB-178 192 HC$3.00 MF$0.65

18I. Reactor Engineering and Operation

SUMMARY REVIEW OF FLOWMETERS SUITABLE FOR MEASURING SODIUM FLOW AT TEMPERATURES UP TO 1200 DEGREES F IN THE FAST FLUX TEST FACILITY (FFTF),
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 22 10.
ANL-7340 HC$3.00 MF$0.65

SUPPLEMENTARY MATERIAL TO THE REPORT NUCLEAR FUEL REQUIREMENTS AND COSTS OF VARIOUS REACTOR TYPES IN GERMANY, KFK 366.
Ergaenzendes Material Zum Bericht Kernbrenns-Toffbedarf Und Kosten Verschiedener Reaktor-ty- Pen in Deutschland, Kfk 366
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Angewandte Reaktorphysik.
H. Gruemm, D. Gupta, W. Haefele, P. Jansen, and M. Recker. Sep 66, 246p KFK-466, AEC-TR-6859
Tran- Transl. Into English From Rept. Kff-466

Descriptors: *Germany, *Nuclear fuels, *Reactor technology, Cost estimates, Mathematical models, Nuclear fuel elements, Research projects.

For abstract, see STAR 06 12.
N68-22608 HC$3.00 MF$0.65

CAN RUPTURE DETECTOR FOR THE REACTOR OSIRIS.
Detection de Rupture de Gaine Du Reacteur Osiris
Commissariat A L Energie Atomique, Saclay (France).
P. Douet, and J. Graftieaux. Dec 67, 57p CEA-R-3328
Lang- in French

Descriptors: *Detection, *Nuclear reactors, *Rupturing, Calibrating, Computation, Installing, Performance prediction, Sensitivity.

For abstract, see STAR 06 12.
N68-22770 HC$3.00 MF$0.65

EXPERIENCE WITH CANDU REACTORS AND THEIR POTENTIAL.
Atomic Energy of Canada, Ltd., Chalk River (Ontario). Nuclear Labs.
A. M. Aikin. Nov 67, 13p AECL-2795, CONF-671210-1
Conf- Presented At the Iaea Conf. on Prospects and Probl. of Nucl. Power Appl. in Developing Countries, Santiago, 4-8 Dec. 1967

Descriptors: *Boiling water reactors, *Heavy water reactors, *Organic cooled reactors, *Pressurized water reactors, *Reactor technology, Conferences, Economics.

For abstract, see STAR 06 12.
N68-23007 HC$3.00 MF$0.65

CURRENT STATUS OF CANADIAN ORGANIC COOLED REACTOR TECHNOLOGY.
Atomic Energy of Canada, Ltd., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
R. G. Hart, S. R. Hatcher, A. J. Mooradian, R. F. Robertson, and D. R. Tegart. Sep 67, 20p AECL-2943, SM-99/33
Conf- Presented At the Iaea Symp. on Heavy Water Power Reactors, Vienna, 11-15 Sep. 1967

Descriptors: *Heavy water reactors, *Organic cooled reactors, *Reactor technology, Conferences, Coolants, Nuclear fuels, Power reactors, Pressure vessels, Reactor materials.

For abstract, see STAR 06 12.
N68-23008 HC$3.00 MF$0.65

CRITICAL EXPERIMENTS CARRIED OUT WITH A HOMOGENEOUS PLUTONIUM SOLUTION. EXPERIMENTAL RESULTS. THEORETICAL INTERPRETATIONS.
Experiences de Criticite Realisees Avec Une Solution Homogene de Plutonium - Resultats Experimentaux - Interpretations Theoriques
Commissariat A L Energie Atomique, Saclay (France).
J.-C. Bouly, R. Caizergues, E. Deilgat, M. Houelle, and P. Lecorche. Dec 67, 91p CEA-R-3367
Lang- in French

Descriptors: *Critical point, *Fissionable materials, *Nuclear emulsions, *Nuclear reactions, *Plutonium, Circular cylinders, Flat plates, Nitrogen, Reactivity.

For abstract, see STAR 06 12.
N68-23017 HC$3.00 MF$0.65

PRESSURIZED WATER REACTOR (PWR) PROJECT.
Technical progress rept. 21 Oct 67-26 Jan 68.
Bettis Atomic Power Lab., Pittsburgh, Pa.
26 Jan 68, 52p
Contract AT (11-1)-GEN-14

Descriptors: (*Pressurized water reactors, Operation), Nuclear power plants, Reactor materials, Reactor control, Reactor fuels, Fission products, Shielding.

For abstract, see NSA 22 10.
WAPD-MRP-123 HC$3.00 MF$0.65

18J. Reactor Materials

A FIELD-EMISSION MICROSCOPE INVESTIGATION OF THE EFFECTS OF AMBIENT ATMOSPHERES ON THE STRESS-CORROSION CRACKING OF URANIUM-MOLYBDENUM ALLOYS.
Arizona Univ Tucson Dept of Electrical Engineering
For primary bibliographic entry see Field 11F.
AD-669 252 HC$3.00 MF$0.65

DETERMINATION OF MICROGRAM QUANTITIES OF FLUORIDE IN METAL OXIDES,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 22 10.
BNWL-601 HC$3.00 MF$0.65

ZERO POWER EXPERIMENTS WITH 235 U-ENRICHED THORIA AND THORIUM METAL LATTICES FOR THE HWOCR,
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
For primary bibliographic entry see Field 18M.
For abstract, see NSA 22 10.
DP-1125 HC$3.00 MF$0.65

CORROSION EVALUATION OF EQUIPMENT USED FOR REPROCESSING ZIRCONIUM ALLOY NUCLEAR FUELS,
Idaho Nuclear Corp., Idaho Falls.
C. A. Zimmerman, and T. L. Hoffman. Feb 68, 10p
Contract AT (10-1)-1230

Descriptors: (*Reactor fuels, Zirconium alloys), (*Uranium alloys, Reactor fuels), Manufacturing

methods, Corrosion, Stainless steel, Design, Specifications, Failure (Mechanics), Heat treatment, Storage, Chemical properties, Aluminum, Recovery.

For abstract, see NSA 22 10.
IN-1134 HC$3.00 MF$0.65

TRIPLE POINT DEPRESSION CURVES FOR THE BINARY SYSTEMS TUNGSTEN HEXAFLUORIDE IN URANIUM HEXAFLUORIDE AND MOLYBDENUM HEXAFLUORIDE IN URANIUM HEXAFLUORIDE. THEIR APPLICATION TO METHODS OF ANALYSES,
Oak Ridge Gaseous Diffusion Plant, Tenn.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 22 10.
K-1697 HC$3.00 MF$0.65

MOLYBDENUM HEXAFLUORIDE-HYDROGEN FLUORIDE TRIPLE POINT CURVE AND ITS APPLICATION TO A METHOD OF ANALYSIS,
Oak Ridge Gaseous Diffusion Plant, Tenn.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 22 10.
K-1698 HC$3.00 MF$0.65

THE SOLUBILITIES OF SELECTED ELEMENTS IN LIQUID PLUTONIUM. XII. CHROMIUM,
Los Alamos Scientific Lab., N. Mex.
D. F. Bowersox. 21 Dec 67, 5p
Contract W-7405-eng-36
See also LA-4732.

Descriptors: (*Liquid metals, *Plutonium), (*Chromium, Solubility), Reactor fuels, Impurities.

For abstract, see NSA 22 10.
LA-3850 HC$3.00 MF$0.65

INVESTIGATION OF TWO METHODS FOR MEASURING FREE ACID IN PLUTONIUM SOLUTIONS,
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 22 10.
LA-3876 HC$3.00 MF$0.65

DILATOMETRIC INVESTIGATIONS OF THE TRANSFORMATION BETA YIELD ALPHA IN U - 0.4 PERCENT WT. CR ALLOY.
Badania Dilatometryczne Kinetyki Przemiany Beta Yield Alpha W Stopie U - 0,4 Percent Ciez.Cr
Polish Academy of Sciences, Warsaw.
A. Hofman. 1967, 23p REPT.-874/14/PS
Lang- in Polish, English Summary

Descriptors: *Chromium alloys, *Isothermal processes, *Phase transformations, *Uranium alloys, Activation energy, Extensometers, Kinetic equations, Quantitative analysis, Temperature profiles.

For abstract, see STAR 06 12.
N68-22322 HC$3.00

DESIGN, FABRICATION, AND FABRICATION EVALUATION OF HIGH TEMPERATURE FUEL PINS FINAL REPORT.
Battelle-northwest, Richland, Wash. Pacific Northwest Lab.
R. L. Gulley. 22 Apr 68, 37p NASA-CR-72387
Contract NAS3-7960

Descriptors: *High temperature environments, *Nuclear fuel elements, *Reactor technology, Cladding, Evaluation, Fabrication, High temperature tests, Irradiation, Metal coatings, Molybdenum, Radiation effects, Reactor cores, Uranium oxides.

For abstract, see STAR 06 12.
N68-22587 HC$3.00 MF$0.65

SUPPLEMENTARY MATERIAL TO THE REPORT NUCLEAR FUEL REQUIREMENTS AND COSTS OF VARIOUS REACTOR TYPES IN GERMANY, KFK 366.
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Angewandte Reaktorphysik.
For primary bibliographic entry see Field 18I.
For abstract, see STAR 06 12.
N68-22608 HC$3.00 MF$0.65

NEUTRON INTERACTION DATA FOR TANTALUM IN THE ENERGY RANGE 1.OE-10 ME V TO 15.0 ME V.
United Kingdom Atomic Energy Authority, Risley (England). Authority Health and Safety Branch.
W. Hart. Mar 68, 43p AHSB/S/-R-141

Descriptors: *Elementary particle interactions, *Energy levels, *Neutron cross sections, *Scattering cross sections, *Tantalum, Data acquisition, Neutron scattering, Nuclear reactions, Nuclear structure, Reference systems, Surveys.

For abstract, see STAR 06 12.
N68-22616 HC$3.00 MF$0.65

ON REACTOR MATERIALS QUARTERLY REPORT, 1 JUL. - 30 SEP. 1967.
Chantiers de L Atlantique Saint-nazaire (France).
9 Jan 68, 5p QR-10, EURAEC-1963
Contract EURATOM-054-61-12-RDF
Tran- Transl. Into English From French

Descriptors: *Impact strength, *Magnesium, *Molybdenum, *Steels, *Stress relaxation, Ambient temperature, Degassing, Normalizing (heat treatment).

For abstract, see STAR 06 12.
N68-22647 HC$3.00 MF$0.65

AUTOMATIC CONTROL SYSTEM IN THE REACTOR PEGGY.
Systeme de Pilotage Automatique Du Reacteur Peggy
Commissariat A L Energie Atomique, Cadarache (France).
J. Bertrand, D. Da-costa, C. Desandre-navarre, and R. Mourchon. Dec 67, 59p CEA-R-3323
Lang- in French

Descriptors: *Automatic control, *Logarithms, *Logic circuits, *Nuclear reactor control, Commutation, Electric potential, Electric power transmission, Error signals, Transformers.

For abstract, see STAR 06 12.
N68-22720 HC$3.00 MF$0.65

IRRADIATION OF UO2 SHEATHED IN THICK TUBES - EFFECT OF INITIAL GAP.
Irradiation D Oxyde D Uranium en Gaine Resistante Effet Du Jeu Diametral Initial Sur le Comportement Global (Programme Cc-7 - 1ere Et 2eme Tranches)
Commissariat A L Energie Atomique, Grenoble (France).
B. D. De Sigoyer, R. Delmas, and J.-C. Janvier. Oct 67, 77p CEA-R-3358
Lang- in French

Descriptors: *Nuclear fuel elements, *Thermal expansion, *Uranium oxides, *Zircaloys (trademark), Encapsulating, Fission products, Radiation effects, Sheaths, Thermal stresses.

For abstract, see STAR 06 12.
N68-22760 HC$3.00 MF$0.65

KINETIC STUDY OF HEXAVALENT PLUTONIUM REDUCTION BY HYDROGEN PEROXIDE IN ACID SOLUTION.
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France).
For primary bibliographic entry see Field 7E.
For abstract, see STAR 06 12.
N68-22904 HC$3.00 MF$0.65

STUDY OF CARTRIDGE RUPTURE DETECTION INSTALLATIONS.
Contribution A L Etude des Installations de Detection de Ruptures de Gaine
Commissariat A L Energie Atomique, Saclay (France).
P. Douet, J. Graftieaux, and A. Roguin. Dec 67, 91p CEA-R-3342
Lang- in French

Descriptors: *Jackets, *Nuclear fuel elements, *Reactor safety, *Rupturing, Cladding, Encapsulating, Nuclear reactor control, Radiation hazards, Reaction control.

For abstract, see STAR 06 12.
N68-22973 HC$3.00 MF$0.65

ALKALINE WATER P H CONTROL BY ION-EXCHANGE USING A SINGLE MIXED BED.
United Kingdom Atomic Energy Authority, Harwell (England).
S. S. Hill, and J. Monahan. Dec 66, 19p AERE-M-1829

Descriptors: *Beds (process engineering), *Ion exchanging, *Ph, *Water treatment, Acid base equilibrium, Acidity, Alkalies, Ammonium compounds, Hydroxyl compounds, Ion exchange resins, Lithium, Loops, Potassium.

For abstract, see STAR 06 12.
N68-22975 HC$3.00 MF$0.65

REACTION OF URANIUM AND PLUTONIUM CARBIDES WITH AUSTENITIC STEELS.
Reaction des Carbures D Uranium Et de Plutonium Avec des Aciers Austenitiques
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France).
M. Mouchnino. Oct 67, 38p CEA-R-3353
Lang- in French

Descriptors: *Austenitic stainless steels, *Phase transformations, *Plutonium compounds, *Reaction kinetics, *Uranium carbides, Carbon, Carbon steels, Critical temperature, Heat resistant alloys, Molybdenum, Nickel, Titanium.

For abstract, see STAR 06 12.
N68-23019 HC$3.00 MF$0.65

SOLVENT STABILITY IN NUCLEAR FUEL PROCESSING. EVALUATION OF THE LITERATURE, CALCULATION OF RADIATION DOSE, AND EFFECTS OF IODINE AND PLUTONIUM,
Oak Ridge National Lab., Tenn.
Charles A. Blake, Jr. Mar 68, 35p
Contract W-7405-eng-26

Descriptors: (*Reactor fuel processing, Solvents), Reviews, Stability, Dose rate, Iodine, Plutonium, Solvent extraction, Fast reactors.

For abstract, see NSA 22 10.
ORNL-4212 HC$3.00 MF$0.65

HOT-CELL EVALUATION OF THE GRIND-LEACH PROCESS. II. RECOVERY OF URANIUM AND THORIUM FROM IRRADIATED PYROLYTIC-CARBON-COATED SOL-GEL THORIA-URANIA PARTICLES,
Oak Ridge National Lab., Tenn.
J. H. Goode, and J. R. Flanary. Mar 68, 17p
Contract W-7405-eng-26
See also ORNL-4117.

Descriptors: (*Reactor fuel processing, Effectiveness), Uranium, Thorium, Recovery, Gas-cooled reactors.

For abstract, see NSA 22 10.
ORNL-4213 HC$3.00 MF$0.65

EFFECTS OF ACID CONCENTRATION AND FEED-PARTICLE SIZE ON THE DISSOLUTION OF PLUTONIUM-BEARING MATERIALS,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
G. F. Molen. 29 Feb 68, 10p
Contract AT (29-1)-1106

Descriptors: (*Plutonium, Recovery), Nitric acid, Concentration (Chemistry), Particle size.

For abstract, see NSA 22 10.
RFP-890 HC$3.00 MF$0.65

NUCLEAR FUELS AND MATERIALS DEVELOPMENT PROGRAM SUMMARY FOR 1965,
Division of Reactor Development and Technology (AEC), Washington, D. C. Fuels and Materials Branch.
Ruth Ann Newman. Jan 66, 271p

Descriptors: (*Reactor fuel processing, Reviews), (*Reactor materials, Preparation), Gas-cooled reactors, Organic cooled reactors, Fast reactors, Breeder reactors.

For abstract, see NSA 22 10.
TID-11295-Pt-2-Ed-5 HC$3.00 MF$0.65

18K. Reactor Physics

INVESTIGATIONS OF EPITHERMAL NEUTRON SPECTRA BY MEANS OF THIN RESONANCE FOILS (UNTERSUCHUNG EPITHERMISCHER NEUTRONENSPEKTREN MIT DUNNEN RESONANZSONDEN),
Foreign Technology Div Wright-Patterson AFB Ohio
P. Schumann, and D. Albert. 12 Oct 67, 13p Rept no. FTD-HT-23-821-67
Edited trans. of Kernenergie (East Germany) n2 p88-92 1965, by J. Stock.

Descriptors: (*Thermal reactors, *Neutron spectrum), (*Neutron detectors, Foils), Thermal neutrons, Neutron flux, Manganese, Molybdenum, Gold, Indium, Tungsten, Lanthanum, Samarium, Neutron activation, Nuclear resonance, Reactor system components, East Germany.
Identifiers: Reactor thermal columns, Translations.

Using the resonance detectors 115In, Au, 152Sm, 186W, La, Mn, and 98Mo epithermal neutron spectra were studied at various points of the RFR core and in the vertical channel 2 of the RFR thermal column in the energy range 1 to 500 ev with respect to their deviations from 1/E behavior. In an air-filled channel at the periphery of the core, alpha = 0.98 + or - 0.02 was found by an absolute determination. The other measurements have been referred to this value. In the vertical channel 2 of the RFR thermal column (distance from the core boundary 60 cm), alpha = 1.04 + or - 0.02. (Author)
AD-669 298 HC$3.00 MF$0.65

BULK SHIELD FACILITY IRRADIATION ACCOMMODATIONS AT THE AIR FORCE NUCLEAR ENGINEERING TEST FACILITY.
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
For primary bibliographic entry see Field 18M.
AD-669 685 HC$3.00 MF$0.65

DETERMINATION OF NEUTRON FLUX PARAMETERS FROM REACTION RATE DATA FOR THERMAL AND EPITHERMAL FLUX DETECTORS USED IN HARWELL REACTORS.
United Kingdom Atomic Energy Authority, Harwell (England).
P. Carter, and E. D. Jones. Mar 67, 34p AERE-M-1870

Descriptors: *Data reduction, *Flux (rate), *Neutron counters, *Nuclear reactors, *Radiation detectors, *Radiation measuring instruments, Neutron emission, Neutron flux density, Theoretical physics.

For abstract, see STAR 06 12.
N68-22569 HC$3.00 MF$0.65

18M. Reactors (Non-Power)

BULK SHIELD FACILITY IRRADIATION ACCOMMODATIONS AT THE AIR FORCE NUCLEAR ENGINEERING TEST FACILITY.
Technical rept.,
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
E. J. Vallish. Jun 66, 40p
AFIT-TR-66-9

Descriptors: (*Air Force research, *Nuclear engineering), (*Nuclear reactors, Scientific research), Fast neutrons, Gamma emission, Dose rate, Metallurgy, Neutron flux, Research reactors, Medical research, Solid state physics, Nuclear physics, Radiochemistry, Configuration, Shielding, Water, Photographs, Neutron activation.
Identifiers: *Bulk shield facility.

The report describes the Bulk Shield Facility (BSF) located in the Air Force Nuclear Engineering Test Facility (AF NETF). The AF NETF has a 10-megawatt nuclear reactor and is located in Area B of Wright Patterson Air Force Base, Ohio. This report is intended to assist engineers and scientists who may be contemplating research and development, engineering and applied testing, and technological applications in the following functional areas. Metallurgy; Biomedical Research; Solid State Physics and Electronic Systems; Nuclear Engineering; Nuclear Physics; Radiochemistry; and Activation Analysis. (Author)
AD-669 685 HC$3.00 MF$0.65

A STUDY OF HYDRAULIC AND NUCLEAR STABILITY OF BOILING WATER PARALLEL FLOW CHANNEL REACTOR SYSTEMS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
J. R. Worden, D. S. Rowe, and P. J. Dionne. Feb 68, 173p
Contract AT (45-1)-1830

Descriptors: (*Nuclear reactors, Stability), Circulating fuel reactors, Reactor fuels, Hydraulic systems, Thermal properties, Flow fields, Programming (Computers), Boiling water reactors, Control systems, Automatic.
Identifiers: Parallel channel reactor systems, Nuclear stability, Computer simulation.

For abstract, see NSA 22 10.
BNWL-574 HC$3.00 MF$0.65

ZERO POWER EXPERIMENTS WITH 235 U-ENRICHED THORIA AND THORIUM METAL LATTICES FOR THE HWOCR,
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
D. J. Pellarin, N. P. Baumann, and J. L. Crandall. Nov 67, 100p
Contract AT (07-2)-1

Descriptors: (*Heavy water reactors, Reactor fuels), Neutrons, Thorium, Uranium, Rods, Nuclear power plants, Radioactive series, Temperature, Physical properties, Experimental data.

For abstract, see NSA 22 10.
DP-1125 HC$3.00 MF$0.65

GAMMA FLUX AND HEAT DEPOSITION IN PLUM BROOK REACTOR - COMPARISON OF CALCULATION AND EXPERIMENT.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. J. Bacigalupi, and B. E. Thinger. Apr 68, 24p
NASA-TM-X-1539

Descriptors: *Gamma rays, *Heat transfer, *Radiation effects, *Thermionic diodes, Analysis (mathematics), Computer programs, Kernel functions, Point sources, Temperature measurement.

For abstract, see STAR 06 12.
N68-22022 HC$3.00 MF$0.65

THE OAK RIDGE RESEARCH REACTOR SAFETY ANALYSIS,
Oak Ridge National Lab., Tenn.
F. T. Binford, R. S. Stone, and C. C. Webster. Mar 68, 69p
Contract W-7405-eng-26

Descriptors: (*Nuclear reactors, Safety), Operation, Fission products, Radiation injuries, Shielding, Radiation hazards, Fission product poisoning, Dose rate, Tennessee, Analysis.

For abstract, see NSA 22 10.
ORNL-4169-Vol-2 HC$3.00 MF$0.65

18N. SNAP Technology

SPACE ELECTRIC POWER R AND D PROGRAM.
Quarterly status rept. for the period ending January 31, 1968.
Los Alamos Scientific Lab., N. Mex.
21 Feb 68, 7p
Contract W-7405-eng-36

Descriptors: (*Spacecraft, Power supplies), (*Nuclear power plants, Spaceborne), Thermionic converters, Auxiliary power plants, Thermal insulation, Shielding, Thermoelectricity, Heat exchangers, Potassium, Beryllium, Pipes.
Identifiers: *Heat pipes.

For abstract, see NSA 22 10.
LA-3881-Pt-1 HC$3.00 MF$0.65

SNAP-21 PROGRAM, PHASE II. DEEP SEA RADIOISOTOPE-FUELED THERMOELECTRIC GENERATOR POWER SUPPLY SYSTEM.
Quarterly rept., no. 6, 1 Oct-31 Dec 67,
Minnesota Mining and Mfg. Co., St. Paul.
F. Fox. Feb 68, 178p
Contract AT (30-1)-3691

Descriptors: (*Nuclear power plants, Underwater vehicles), Radioactive isotopes, Shielding, Deep water, Thermionic converters, Auxiliary power plants.
Identifiers: SNAP, SNAP-21.

For abstract, see NSA 22 10.
MMM-3691-26 HC$3.00 MF$0.65

RESULTS OF STUDIES ON THERMIONIC REACTOR SYSTEMS.
Ergebnisse Von Studien Ueber Thermionikreaktor-systeme
Technische Hochschule Stuttgart (West Germany). Institut Fuer Kernenergetik.
S. Dagbjartsson, D. Emendoerfer, M. Groll, W. Haug, and R. Pruschek. 1968, 39p REPT.-68-007
Lang- in German, English Summary Conf- Presented At Dglr Symp. on Energy Provision in Space No. 2, Munich, 14 Mar. 1968

Descriptors: *Ion engines, *Spacecraft power supplies, *Thermionic power generation, Nuclear fuels, Power efficiency, Radiation shielding, Reactor design, Reactor technology, Snap, Thermionic converters.

For abstract, see STAR 06 12.
N68-21856 HC$3.00 MF$0.65

MATERIAL REQUIREMENTS FOR DYNAMIC NUCLEAR SPACE POWER SYSTEMS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. L. Davies, P. E. Moorhead, and T. A. Moss. 1967, 67p NASA-TM-X-52344
Conf- Presented At Inter Ann. Meeting of the Asme, Pittsburgh, 12-17 Nov. 1967 12-17 Nov. 1967

Descriptors: *Brayton cycle, *Nuclear auxiliary power units, *Rankine cycle, *Spacecraft power supplies, High temperature environments, Materials tests, Nuclear electric power generation.

For abstract, see STAR 06 12.
N68-21968 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF REACTOR-LOOP TRANSIENTS DURING STARTUP OF A SIMULATED SNAP-8 SYSTEM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
H. B. Block, K. S. Jefferies, and P. A. Thollot. May 68, 46p NASA-TN-D-4546
Contract 701-04-00-02-22

Descriptors: *Rankine cycle, *Snap 8, Closed cycles, Flow characteristics, Liquid metals, Pressure distribution, Reactor technology, Spacecraft power supplies, Temperature distribution, Thermodynamics.

For abstract, see STAR 06 12.
N68-22257 HC$3.00 MF$0.65

DIFFERENTIAL MEASUREMENT OF THE EARTH'S MAGNETIC FIELD BY NUCLEAR MAGNETIC RESONANCE.
Mesure Differentielle Du Champ Magnetique Terrestre Par Resonance Magnetique Nucleaire
Commissariat A L Energie Atomique, Grenoble (France).
F. Robach. 1967, 93p CEA-R-3121
Lang- in French

Descriptors: *Geomagnetism, *Magnetic anomalies, *Magnetometers, *Nuclear magnetic resonance, Magnetic transducers, Paramagnetic resonance, Proton precession.

For abstract, see STAR 06 12.
N68-22699 HC$3.00 MF$0.65

STUDY OF THE CHEMICAL INTEGRITY OF RADIOISOTOPE CONTAINMENT MATERIALS IN LAUNCH ABORT ENVIRONMENTS,
TRW Systems, Redondo Beach, Calif.
For primary bibliographic entry see Field 22D.
For abstract, see NSA 22 10.
SC-CR-67-2830 HC$3.00 MF$0.65

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

SAFETY: AMC SAFETY MANUAL.
Army Materiel Command Washington D C
For primary bibliographic entry see Field 13L.
AD-669 253 MF$0.65

STUDY OF VISUAL CAST FLARE BINDER MATERIAL,
Ordnance Research Inc Fort Walton Beach Fla
Hal R. Waite, and Yoshiyuki Arikawa. Jan 68, 28p NAD-CR-RDTR-113
Contract N00164-67-C-0479

Descriptors: (*Flares, *Binders), Casting, Illumination, Intensity, Optimization, Polyester plastics, Acrylic resins, Magnesium, Oxidizers, Sodium compounds, Perchlorates.

Castable visual flare formulations and techniques were developed that produce luminous efficiencies greater than 50,000 candle-seconds/gram. Improved luminous efficiencies and ease of casting were made possible with a relatively high binder percentage of sixteen percent. No pressure is required for casting. Liquid polyester binder systems were found to provide optimum characteristics for casting as well as luminous efficiency with their high oxygen and low carbon content. Optimum sodium perchlorate oxidizer to magnesium fuel ratio was determined to be one to one with oxidizer partially dissolved in liquid binder. Flare grains in sizes from 3.2 inches to 4 inches in diameter were cast and tested with no significant change in efficiency versus diameter. (Author)
AD-669 434 HC$3.00 MF$0.65

DEVELOPMENT OF THE CONTINUOUS WIRE METHOD PROGRESS REPORT IV. COMPARISON WITH OPTICAL MEASUREMENTS OF DETONATION PROPERTIES,
Naval Ordnance Lab White Oak Md
John P. Toscano, A. Robert Clairmont, Jr., Irving I. Jaffe, and Donna Price. 2 Apr 68, 21p Rept no. NOLTR-68-30

Descriptors: (*Charges (Explosive), Burning rate), (*Detonators, Wire), Implants, RDX, TNT, Waxes, Composite materials, Casting, Cylindrical bodies, Correlation techniques, Optical analysis, Copper, Resistance (Electrical), Solid rocket propellants, Circuits, Photographic techniques, Illumination, Argon.
Identifiers: Cast comp B explosive charges, *Continuous wire method.

Measurements made with the continuous wire method are compared to those obtained optically of shock-to-detonation transitions in cast Comp B. (Author)
AD-669 441 HC$3.00 MF$0.65

TRANSITIONAL CHARGE RELEASE.
Technical rept.,
Picatinny Arsenal Dover N J Feltman Research Labs
Phillip E. Houser. May 68, 24p
PA-TR-3672

Descriptors: (*Fuzes (Ordnance), *Ferroelectric materials), (*Lead compounds, Ferroelectricity), Zirconates, Titanates, Stannates, Niobates, Antiferroelectricity, Transformations, Electric discharges, Hydrostatic pressure, Capacitance, Dielectric properties, Thermal expansion, Solid solutions.
Identifiers: Lead titanate, Lead zirconate, Lead niobate, Lead stannate.

The pressure-enforced ferroelectric-to-antiferroelectric phase transition in the system PbZrO3-PbTiO3-PbSnO3-PbNb2O6 was investigated as a charge-release mechanism for fuzing. Capacitance, dielectric loss, thermal expansion, and hydrostatic transition pressure were measured over the Mil Spec temperature range. (Author)
AD-669 606 HC$3.00 MF$0.65

LASER TELEMETER FOR ARTILLERY PIECE.
ITT Avionics Nutley N J
For primary bibliographic entry see Field 9F.
AD-669 627 HC$3.00 MF$0.65

19D. Explosions, Ballistics, and Armor

THEORY OF SHOCK WAVES AND INTRODUCTION TO GAS DYNAMICS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 272 HC$3.00 MF$0.65

INVESTIGATION OF MATERIALS COMBUSTIBILITY, FIRE, AND EXPLOSION SUPPRESSION IN A VARIETY OF ATMOSPHERES.
Dynamic Science Corp Monrovia Calif
For primary bibliographic entry see Field 21B.
AD-669 349 HC$3.00 MF$0.65

SOIL SURVEY AND SUPPORT ACTIVITIES OPERATION DISTANT PLAIN EVENT 6.
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 8M.
AD-669 616 HC$3.00 MF$0.65

CALCULATIONS OF EXPANDING SHOCK WAVES AND LATE-STAGE EQUIVALENCE.
Final rept. Aug 65-Nov 67,
Drexel Inst of Tech Philadelphia Pa
Shih Lien Huang, and Pei Chi Chou. Apr 68, 87p Rept no. DIT-125-12
Contract DA-18-001-AMC-876 (X)

Descriptors: (*Explosions, Flow fields), Numerical analysis, Pressure, Explosion effects, Spheres, Shock waves.
Identifiers: Pressure distribution, Method of characteristics.

A numerical scheme based on the method of characteristics is developed and applied to the flow field of the expansion of a high pressure sphere into atmosphere. It is shown that this method is very accurate, involving errors of less than 1%. In calculating the expanding sphere, two rather challenging problems, namely, the initial singularity and the formation of a second shock, are successfully solved through special techniques. The formation of an inward traveling shock, in addition to the main shock, is found to exist at the tail of the left traveling rarefaction wave. The strength of the second shock remains rather weak at the early stage of its development, it becomes very strong just before reaching the center of the sphere. It is shown that 'late-stage equivalence' exists in the expansion of high pressure spheres into atmosphere, provided the initial total energy in each of the spheres is held constant. Late-stage equivalence is assumed to exist if the peak pressure distribution for different expanding spheres are the same for long times. (Author)
AD-669 645 HC$3.00 MF$0.65

BASIC RESEARCH ON LIQUID-DROP-IMPACT EROSION QUARTERLY REPORT, 8 DEC. 1966 - 8 MAR. 1967.
General Electric Co., Cincinnati, Ohio. Missile and Space Div.
For primary bibliographic entry see Field 20K.
For abstract, see STAR 06 12.
N68-22297 HC$3.00 MF$0.65

COMPENDIUM OF SHOCK WAVE DATA,
California Univ., Livermore. Lawrence Radiation Lab.
M. van Thiel, and A. S. Kusubov. Oct 67, 524p
Contract W-7405-eng-48

Descriptors: (*Shock waves, Impact), Penetration, Impact shock, Materials, Data.

For abstract, see NSA 22 10.
UCRL-50108-Vol-1-Suppl-1 HC$3.00 MF$0.65

COMPENDIUM OF SHOCK WAVE DATA,
California Univ., Livermore. Lawrence Radiation Lab.
M. van Thiel, and A. S. Kusubov. Oct 67, 231p
Contract W-7405-eng-48

Descriptors: (*Shock waves, Impact), Penetration, Impact shock, Materials, Data.

For abstract, see NSA 22 10.
UCRL-50108-Vol-2-Suppl-1 HC$3.00 MF$0.65

CALCULATION OF FREE-FIELD MOTION FOR THE PILEDRIVER EVENT,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 22 10.
UCRL-50373 HC$3.00 MF$0.65

20. PHYSICS

20A. Acoustics

POSSIBILITIES AND DEVICES FOR THE SUPPRESSION OF JET NOISE,
Boeing Co Renton Wash Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 210 HC$3.00 MF$0.65

TEST RESULTS FROM THE BOUNDARY LAYER FACILITY - RESPONSE OF STRUCTURE TO THE PSEUDO-SOUND FIELD OF A JET (USING COMBINED CONTINUUM AND FINITE ELEMENT METHOD),
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 215 HC$3.00 MF$0.65

TEST RESULTS FROM THE BOUNDARY LAYER FACILITY (THEORY AND EXPERIMENTAL COMPARISON),
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 217 HC$3.00 MF$0.65

ACOUSTIC SCALING BETWEEN MODEL COLD FLOW AND HOT FLOW JETS.
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 219 HC$3.00 MF$0.65

SOUND IN NATURE AND THE ACOUSTIC CLIMATE (ZVUK V PRIRODE I AKUSTICHESKII KLIMAT),
Foreign Technology Div Wright-Patterson AFB Ohio
V. I. Arabadzhi. 11 Aug 67, 26p Rept no. FTD-MT-66-174
Edited machine trans. of Priroda (USSR) n11 p41-9 1965.

Descriptors: (*Sound signals, Propagation), (*Atmosphere, Acoustic properties), Auditory signals, Atmospheric temperature, Humidity, Wind, Site selection, Refraction, Ranges (Distance), Attenuation, Noise, Performance (Human), USSR.
Identifiers: Translations.

The author discusses various problems in acoustic climatology, i.e., the acoustic regime of a locality as determined by the excitation and propagation of sound waves. The propagation of sound in the atmosphere, ionosphere, and on earth is described. The concepts of sound shadow, wave channels, wave-guides, range of audibility, sonic vibrations, bioacoustics, etc., are discussed.
AD-669 301 HC$3.00 MF$0.65

SEMICONDUCTOR JUNCTION PROPERTIES AS INFLUENCED BY CRYSTALLOGRAPHIC IMPERFECTIONS.
International Business Machines Corp Hopewell Junction N Y East Fishkill Facility
For primary bibliographic entry see Field 9A.
AD-669 335 HC$3.00 MF$0.65

INTERACTION BETWEEN AIR FLOW AND AIRBORNE SOUND IN A DUCT: VOLUME II. ACOUSTIC EXCITATION OF BOUNDARY LAYER AND RADIATION IMPEDANCE OF ORIFICES.
Final rept. Feb 64-Jan 65,
Goettingen Univ (West Germany) Physikalisches Institut
F. P. Mechel, P. A. Mertens, and W. M. Schilz.
Nov 67, 55p
AMRL-TR-67-120-Vol-2
Contract AF 61 (052)-666
See also AD-669 085.

Descriptors: (*Aerodynamic noise, *Ducts), (*Sound transmission, Porous materials), Boundary layer, Acoustic impedance, Interactions, Airborne, Orifices, Gas flow, Oscillation, Stability, Walls, Nozzle gas flow, Mach number, Reflection, West Germany.

The report presents the results of three experimental studies on the interaction between air flow and airborne sound in a duct. The first experiment concerns the excitation and suppression of boundary-layer distortions (created by flexural wave-like wall oscillations). Mathematical approximations show and experimental results confirm that the stability of the boundary layer is shifted to higher Reynolds numbers by the flexural wave. The second experiment relates the boundary-layer (produced by static suction) stabilization to the sound field influencing it. Results show that the particle velocity of sound penetrating a porous section of the wall leads to an increase of boundary-layer distortions and that this effect could be suppressed when the flow velocity of the static suction exceeded a threshold value. The final experiment shows the influence of a superimposed air flow on the acoustic impedance of orifices terminating a tube and of constriction, enlargements, and nozzles within a tube. Results show that if the frequency is scaled according to the Mach number, then the ratio between the reflection coefficient gamma pm at Mach number M and the reflection coefficient at zero flow velocity gamma po is independent from the frequency. (Author)
AD-669 358 HC$3.00 MF$0.65

APPLICATION OF THE NEAR-FIELD-ARRAY TECHNIQUE TO SONAR EVALUATION,
Naval Research Lab Orlando Fla Underwater Sound Reference Div
For primary bibliographic entry see Field 17A.
AD-669 433 HC$3.00 MF$0.65

A PDP-8 FORTRAN PROGRAM FOR NEAR-FIELD ARRAY TESTING,
Naval Research Lab Orlando Fla Underwater Sound Reference Div
For primary bibliographic entry see Field 17A.
AD-669 449 HC$3.00 MF$0.65

OCEANOGRAPHIC THERMAL GRADIENT DISPLAY STUDY.
Futuronics Corp Port Washington N Y
For primary bibliographic entry see Field 8C.
AD-669 488 HC$3.00 MF$0.65

LONGITUDINAL ULTRASONIC ATTENUATION OF PURE STRONG-COUPLING SUPERCONDUCTORS II,
Rutgers - the State Univ New Brunswick N J Dept of Physics
For primary bibliographic entry see Field 20L.
AD-669 498 HC$3.00 MF$0.65

STIMULATED BRILLOUIN SCATTERING.
Cornell Univ Ithaca N Y School of Electrical Engineering
For primary bibliographic entry see Field 20F.
AD-669 577 HC$3.00 MF$0.65

20B. Crystallography

CRITICAL PROPERTIES OF ISOTROPICALLY INTERACTING CLASSICAL SPINS CONSTRAINED TO A PLANE.
Massachusetts Inst of Tech Lexington Lincoln Lab
For primary bibliographic entry see Field 20L.
AD-669 213 Not available from CFSTI.

NEW EXPANSION FOR THE CLASSICAL HEISENBERG MODEL AND ITS SIMILARITY TO THE S=1/2 ISING MODEL,
Massachusetts Inst of Tech Lexington Lincoln Lab
For primary bibliographic entry see Field 20L.
AD-669 216 Not available from CFSTI.

RELATIONSHIP BETWEEN SEGREGATION SUBSTRUCTURES AND CASTING STRUCTURES.
Comision Nacional de Energia Atomica Buenos Aires (Argentina) Departamento de Metalurgia
For primary bibliographic entry see Field 11F.
AD-669 250 HC$3.00 MF$0.65

RAMAN SPECTRA OF POLYCRYSTALLINE H2S AND D2S.
Michigan State Univ East Lansing
For primary bibliographic entry see Field 7D.
AD-669 501 HC$3.00 MF$0.65

MOSSBAUER EFFECT IN STUDYING LATTICE VIBRATION,
Foreign Technology Div Wright-Patterson AFB Ohio
Kai-I Chang. 25 Aug 67, 7p Rept no. FTD-HT-66-502
Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v20 n5 p477-8 1964.

Descriptors: (*Mossbauer effect, *Crystal lattices), Recoil atoms, Resonance absorption, Probability, Frequency, Isomeric transitions, China.

The possibility exists of using the Mossbauer effect to determine experimentally frequency diagrams of crystal lattices that are not of the Debye type. Thus a formula is proposed for determining the lattice frequency diagram using the relationship between the Mossbauer recoilless transition probability and temperature. The formula is applicable to a single-atom cubic lattice.
AD-669 541 HC$3.00 MF$0.65

GROWTH OF SINGLE CRYSTALS OF AMMONIUM PERCHLORATE FROM AQUEOUS SOLUTION,
Explosives Research and Development Establishment Waltham Abbey (England)
H. Edwards. 27 Dec 67, 36p Rept no. ERDE-23/R/67

Descriptors: (*Ammonium perchlorate, *Crystal growth), Solid rocket oxidizers, Single crystals, Additives, Great Britain.

The growing of large single high quality crystals of ammonium perchlorate from solution is difficult because it requires pure solutions for growth and precise control of supersaturation. In this report two methods are described for growing large crystals of ammonium perchlorate, the difference being in the technique of producing supersaturated solution. One method induces excess nutrient into a system by slowly cooling a saturated solution in a linear manner by 0.05 degC per day, while the other uses a thermal gradient to create a flow of solution from a zone in which it is saturated to a cooler zone in which it becomes supersaturated.

A study also has been made of the influence of small traces of additives in the solvent on the crystal growing habit of ammonium perchlorate. (Author)
AD-669 620 HC$3.00 MF$0.65

TRANSFORMATION PLASTICITY OF COBALT-NICKEL SINGLE CRYSTALS,
Illinois Univ Urbana Dept of Mining Metallurgy and Petroleum Engineering
Emmanuel deLamotte, and Carl Altstetter. 15 Apr 68, 58p
AROD-4953:2-MC
Contract DA-31-124-ARO (D)-297

Descriptors: (*Cobalt alloys, Phase studies), (*Nickel alloys, Phase studies), (*Crystal structure, Phase studies), Metallic crystals, Single crystals, Dislocations, Stresses, Dilatometers, X-ray diffraction analysis, Electron microscopy, Models (Simulations).
Identifiers: Allotropic transformations.

The influence of an external stress on the allotropic transformation of single crystals of a Cobalt-30.5% Nickel alloy was investigated. Experimental results were obtained from dilatometry, x-ray diffraction, and optical and electron microscopy. The effects of stresses could be conveniently divided into three stress ranges. In range I, from 0 to about 400 g/sq mm, the specimens exhibited on cooling a multivariant phase change and a considerable amount of retained cubic material. In range II, from 400 g/sq mm to the elastic limit, the product phase had a simpler morphology. Single hexagonal regions grew in size and the cubic phase disappeared with increasing stress level. In range III, just above the elastic limit, specimens transformed into hexagonal single crystals. Specimens prestressed in range III and transformed in range I also became hexagonal single crystals. The observed macroscopic shear directions were mainly 112 on cooling but the behavior was more complicated on heating under stress. To explain these properties of the phase change, a model based on the nucleation of partial dislocations is proposed. (Author)
AD-669 629 HC$3.00 MF$0.65

MORPHOLOGICAL CHANGES IN DISCONTINUOUS GOLD FILMS FOLLOWING DEPOSITION.
Interim rept.,
Florida State Univ Tallahassee Dept of Physics
J. G. Skofronick, and W. B. Phillips. 13 Mar 68, 8p
AFOSR-68-0915
Grant AF-AFOSR-440-67
Availability: Published in Journal of Applied Physics, v38 n12 p4791-6 Nov 1967.

Descriptors: (*Metal films, Vapor plating), (*Gold, Crystal structure), (*Crystal structure, Vapor plating), Vacuum apparatus, Substrates, Carbon, Silicon compounds, Silicon monoxides, Nucleation, Configuration, Transport properties, Surface properties, Electron microscopy.

Vacuum-deposited discontinuous gold films are observed to exhibit temperature-dependent morphological changes following deposition. This effect is observed on both carbon and silicon monoxide substrates. For substrate temperatures between approximately 450 degrees to 750 degrees K the initial deposited nuclei are nearly circular and have a doubled-peaked size distribution. Because of resolution limitations only the part of the distribution with the large sizes is quantitatively examined and discussed. Analysis of the distributions at different time intervals following deposition shows a shift in both the mean radius and the dispersion and a decrease in the number of nuclei per unit area. These changes are discussed in terms of possible mass transfer along the surface. (Author)
AD-669 639 Not available from CFSTI.

TEMPERATURE DEPENDENCE OF THE WIDTH OF THE FUNDAMENTAL LATTICE-VIBRATION ABSORPTION PEAK IN IONIC CRYSTALS. II. APPROXIMATE NUMERICAL RESULTS,
California Univ Irvine Dept of Physics
I. P. Ipatova, A. A. Maradudin, and R. F. Wallis. 29 Apr 68, 17p
AFOSR-68-0921
Grant AF-AFOSR-1080-66
Availability: Published in Physical Review, v155 n3 p882-95 Mar 15 1967.

Descriptors: (*Crystal lattices, Absorption spectrum), Sodium chloride, Lithium compounds, Fluorides, Vibration, Temperature, Numerical analysis.
Identifiers: Lithium fluoride.

The results of numerical calculations of the temperature dependence of the width and position of the fundamental lattice-vibration absorption peak in NaCl and LiF are presented. The calculations are carried out in the high-temperature limit, on the basis of the Hardy-Karo deformation dipole model of these crystals. Cubic and quartic anharmonic terms are retained in the crystal Hamiltonian, but the approximation of neglecting the anharmonicity of the Coulomb forces has been made. The expressions for the Fourier-transformed anharmonic force constants are approximated and simplified by a method suggested by Peierls. (Author)
AD-669 642 Not available from CFSTI.

TEMPERATURE DEPENDENCE OF ATOM-ATOM POTENTIAL IN MOLECULAR CRYSTALS,
Southern Illinois Univ Carbondale School of Technology
J. L. Amoros, and D. Bork. Apr 68, 20p
AFOSR-68-0929
Grant AF-AFOSR-596-66
Availability: Published in Zeitschrift fuer Kristallographie, v125 p52-69 Apr 20 1967.

Descriptors: (*Crystal lattices, Interactions), Anthracenes, Quinones, Amines, Potential energy, Thermal expansion, Temperature.
Identifiers: Anthraquinones, Hexamethylene tetramine.

The temperature dependence of intermolecular atom-atom potential is determined from the known crystal structures of anthracene, anthraquinone and hexamine at different temperatures. It is found that the theoretical equilibrium distance that enters as a parameter in the calculation of the potential energy, is temperature dependent. These distances for the different substances are found to be not equal. This can be explained by introducing the coordination number C of the crystal structure. The resetting of the molecule in the unit cell can be accounted for by the temperature-dependent potentials. (Author)
AD-669 658 Not available from CFSTI.

RELATION BETWEEN PHOTOELASTICITY, ELECTROSTRICTION, AND FIRST-ORDER RAMAN EFFECT IN CRYSTALS OF THE DIAMOND STRUCTURE,
California Univ Irvine Dept of Physics
For primary bibliographic entry see Field 20L.
AD-669 663 Not available from CFSTI.

AN EXPLANATION OF ANOMALOUS NON-HOOKEAN DEFORMATION OF IONIC SINGLE CRYSTALS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
D. R. Behrendt, and J. P. Cusick. May 68, 34p
NASA-TN-D-4513
Contract 129-03-15-03-22

Descriptors: *Bulk modulus, *Ionic crystals, *Single crystals, Annealing, Lithium compounds, Loads (forces), Magnesium compounds, Sodium compounds, Surface properties.
For abstract, see STAR 06 12.
N68-22271 HC$3.00 MF$0.65

POLAR CHARACTER OF ZINC OXIDE CRYSTALS. 2 - ETCH PATTERNS ON PRISM FACES.
Royal Radar Establishment, Malvern (England).
A. Klein. May 67, 11p RRE-TRANS-174
Tran- Transl. Into English From Zeitung Fur Physik (Germany), V. 188, 1965 P 352-360

Descriptors: *Crystal optics, *Diffraction patterns, *Etching, *Prisms, *Zinc oxides, Crystal structure, Crystallography, Polarization characteristics, Refraction, Surface properties.

For abstract, see STAR 06 12.
N68-22381 HC$3.00 MF$0.65

MEASUREMENT OF THE GROWTH RATE OF INDIVIDUAL FACES OF HEXAMETHYLENE TETRAMINE CRYSTALS.
Messung Der Wachstumgeschwindigkeit Einzelner Flaecher An Hexamethylentetramin- Kristallen
National Research Council of Canada, Ottawa (Ontario).
H. Heyer, and B. Honigmann. 1967, 17p NRC-TT-1284
Tran- Transl. Into English From Z. Krist. (Frankfurt Am Main), V. 106, No. 3, 1955 P 199-212

Descriptors: *Crystal growth, *Hexamethylenetetramine, *Single crystals, Crystal defects, Crystal surfaces, Polygonization, Surface defects, Vapor deposition.

For abstract, see STAR 06 12.
N68-22441 HC$3.00 MF$0.65

CONDITIONS FOR THE EXISTENCE OF LAVES PHASES IN INTERMETALLIC SYSTEMS.
les Conditions D'existence des Phases de Laves Dans les Systemes Intermetalliques
Commissariat A L Energie Atomique, Saclay (France).
B. D. Litto. Nov 67, 25p CEA-BIB-92
Lang- in French, English Summary

Descriptors: *Binary alloys, *Crystal structure, *Intermetallics, *Phase transformations, Classifications, Electron density (concentration), Phase diagrams, Solid phases.

For abstract, see STAR 06 12.
N68-23000 HC$3.00 MF$0.65

CARBONATE APATITES,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 8G.
PB-178 095T HC$3.00 MF$0.65

20C. Electricity and Magnetism

NEW EXPANSION FOR THE CLASSICAL HEISENBERG MODEL AND ITS SIMILARITY TO THE S=1/2 ISING MODEL,
Massachusetts Inst of Tech Lexington Lincoln Lab
For primary bibliographic entry see Field 20L.
AD-669 216 Not available from CFSTI.

THE CHARGE MECHANISM IN FERROELECTRICS.
Final rept. 13 Apr 67-12 Apr 68,
Ohio State Univ Research Foundation Columbus
Donald D. Glower. 9 May 68, 5p Rept no. 2
AROD-6708:1-E
Grant DA-ARO (D)-31-124-G924

Descriptors: (*Ferroelectric materials, *Electrical conductance), Lead compounds, Zirconates, Titanates, High-temperature research, Electrochemistry, Transport properties.
Identifiers: Lead zirconate titanate.

The charge transport mechanisms in lead zirconate titanate (Pb (ZrxTi1-x)O3) have been investigated over the range of temperatures from 650 degrees K to 1000 degrees K, by means of an electrochemical concentration cell. Very interesting results have been obtained at the higher temperatures, above 800 degrees K. These data suggest that the electrical conductivity, which is primarily ionic at these temperatures, exhibits an isolated peak in electronic conductivity at a temperature which increases with titanium concentration. Existing electrical shielding problems will soon be solved so that the measurements can be extended to lower temperatures, which will include the ferroelectric phase. (Author)
AD-669 261 HC$3.00 MF$0.65

CURRENT PAUSE DURING ELECTRIC EXPLOSION OF LITTLE WIRES IN THE AIR (TOKOVAYA PAUZA PRI ELEKTRICHESKOM VZRYVE PROVOLOCHEK V VOZDUKHE),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11F.
AD-669 299 HC$3.00 MF$0.65

INTERNAL PHOTOEMISSION IN EVAPORATED Al-Al2O3-Al THIN FILM DEVICES.
Technical rept.,
Air Force Avionics Lab Wright-Patterson AFB Ohio
Julian A. Crawford, Kenneth D. O'Dell, and Fritz L. Schuermeyer. Mar 68, 27p Rept no. AFAL-TR-67-347
Presented at the American Physical Society meeting, Minneapolis, Minn., Jun 66.

Descriptors: (*Photoelectric effect, Metal films), Dielectric films, Aluminum, Alumina, Sandwich construction, Sapphires, Test methods, Dielectric properties, Photosensitivity, Band theory of solids, Microminiaturization (Electronics).
Identifiers: Thin films, Electron beam evaporation, Thin film devices.

The results of a study of internal photoemission in evaporated Al-Al2O3-Al thin-film sandwiches will be presented. The dielectric films for these samples were prepared by electron-beam evaporation from a sapphire rod. This material has a dielectric constant of about 7.5. Film thicknesses were measured capacitively, interferrometrically, and with a quartz-crystal-oscillator microbalance, all of which gave internally consistent results. The photoresponse was measured at room temperature as a function of wavelength at different bias voltages for dielectric films ranging in thickness from about 100 A to less than 40 A. The results, interpreted in terms of metal-insulator barrier height, indicate that the barrier shape is trapezoidal but that the asymmetry decreases abruptly for dielectric thicknesses below about 60 A. The zero-bias barrier height was found to be 1.8 eV for the 42-A films, and it increased rapidly with dielectric thickness. These results will be discussed in terms of the current theories of metal-insulator-metal thin-film devices. (Author)
AD-669 331 HC$3.00 MF$0.65

BREAKDOWN OF DIELECTRICS AND SEMICONDUCTORS (SELECTED ARTICLES).
Foreign Technology Div Wright-Patterson AFB Ohio
6 Oct 67, 43p Rept no. FTD-MT-24-193-67
Edited machine trans. of mono. Proboi Dielektrikov i Poluprovodnikov, Moscow/Leningrad, 1964 p10-21, 106-8, 166-70.

Descriptors: (*Dielectrics, Electric discharges), Dielectric properties, Thickness, Solids, Energy, Crystal lattices, Ionization, Impact, Electron bombardment, Radiation damage, USSR.
Identifiers: Breakdown (Electrical), Translations.

Contents: Certain rules of electrical breakdown of solid dielectrics; On the theoretical strength of solid dielectrics during electrical breakdown; Investigating the energy characteristics of pulse breakdown of solid dielectrics.
AD-669 431 HC$3.00 MF$0.65

VLF ELECTRIC AND MAGNETIC FIELDS OBSERVED WITH THE JAVELIN 8.45 SOUNDING ROCKET,
Iowa Univ Iowa City Dept of Physics and Astronomy
For primary bibliographic entry see Field 4A.
AD-669 492 HC$3.00 MF$0.65

LONGITUDINAL ULTRASONIC ATTENUATION OF PURE STRONG-COUPLING SUPERCONDUCTORS II,
Rutgers - the State Univ New Brunswick N J Dept of Physics
For primary bibliographic entry see Field 20L.
AD-669 498 HC$3.00 MF$0.65

SPIN WAVE DISPERSION AND ENERGY BANDS IN fcc METALS.
Case-Western Reserve Univ Cleveland Ohio
For primary bibliographic entry see Field 20L.
AD-669 548 Not available from CFSTI.

THEORY OF PHOTOELECTRIC DETECTION,
Brandeis Univ Waltham Mass Dept of Physics
For primary bibliographic entry see Field 20F.
AD-669 579 HC$3.00 MF$0.65

TRANSITIONAL CHARGE RELEASE.
Picatinny Arsenal Dover N J Feltman Research Labs
For primary bibliographic entry see Field 19A.
AD-669 606 HC$3.00 MF$0.65

TRANSVERSE WAVE INTERACTIONS BETWEEN ROTATING ELECTRON BEAMS AND WAVE GUIDES.
Technical rept.,
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
R. L. Schriever, C. H. Durney, C. C. Johnson, and R. W. Grow. Apr 68, 151p Rept no. MD-67-035 ECOM-01279-5
Contract DA-28-043-AMC-01279 (E)

Descriptors: (*Microwaves, *Cyclotron resonance phenomena), Interactions, Electron beams, Waveguides, Rotation, Cyclotron waves, Electromagnetic fields, Traveling-wave tubes, Microwave amplifiers, Microwave oscillators.

Microwave interactions resulting in oscillation and amplification have been observed in cases involving a beam of rotating electrons in a wave guide. The interaction is a cyclotron resonance phenomenon which occurs when the rotating electrons are synchronized with the wave guide fields. Application of a general coupled-mode theory to specific rotating beam configurations is made. The dispersion properties of the normal beam modes and normal circuit modes are considered to find possible cases of synchronism which may result in favorable interactions. The coupled-mode equations are solved for important cases with the help of simplifying approximations to find the propagation constants of the waves which can exist in the system. Application of boundary conditions at the input to the interaction circuit completes the interaction description. An expression for gain for the wave guide circuit mode is defined. These calculations show that both backward-wave oscillation and traveling-wave amplification are possible in this type of device, but that the backward-wave interaction dominates. An experimental device has been built with a rotating electron beam in a rectangular X-band wave guide circuit. Experimental investigations reveal that the device is characterized by a backward-wave oscillation interaction. The observed interaction is found to be consistent with the results of the coupled-mode analysis, and the coupled-mode analysis appears to give an accurate description of the interaction mechanism. Oscillator pulsed power of 720 watts with an efficiency of about 10 percent and frequency tuning with magnetic field between 6.55 and 22.0 kmc has been observed. (Author)
AD-669 625 HC$3.00 MF$0.65

MAGNETIZATION MEASUREMENTS AND PRESSURE DEPENDENCE OF THE CURIE POINT OF THE PHASE Sc3In.
Scientific Interim rept.,
California Univ San Diego La Jolla Dept of Physics
W. E. Gardner, T. F. Smith, B. W. Howlett, C. W. Chu, and A. Sweedler. 26 Apr 68, 14p
AFOSR-68-0928
Grant AF-AFOSR-631-67
Availability: Published in Physical Review, v166 n2 p577-88 1968.

Descriptors: (*Intermetallic compounds, Magnetic properties), (*Scandium, Phase studies), (*Indium alloys, Phase studies), Pressure, Anisotropy, Ferromagnetic materials, Transition temperature.
Identifiers: Scandium indiumides, Curie point, Magnetic susceptibility.

The approximate composition limits of the Sc3In phase were determined as 22 to 23 at.% In. Susceptibility measurements have been made on a number of alloys, containing various amounts of the Sc3In phase, in the composition range 21-26 at.% In. Heat and mechanical treatments reveal a critical dependence of the magnetic properties on the degree of order of the Sc3In phase. Although the susceptibility varies inversely with temperature, this behavior is not considered to be evidence for the presence of localized moments, since the magnetic moment per Sc atom is much smaller than that associated with S = 1/2, and does not agree with the value obtained from the magnetization data as a function of magnetic field. Initial susceptibility measurements, below the Curie temperature, exhibit structure which suggests that a strong magnetocrystalline anistropy may exist at temperatures close to Tc. The pressure dependence of the Curie point was determined. (Author)
AD-669 641 Not available from CFSTI.

SURFACE SPIN WAVES,
California Univ Irvine Dept of Physics
R. F. Wallis, A. A. Maradudin, I. P. Ipatova, and A. A. Klochikhin. 11 Apr 68, 7p
AFOSR-68-0923
Grant AF-AFOSR-1080-66
Prepared in cooperation with A. F. Ioffe Physico-Technical Institute, Leningrad K-21.
Availability: Published in Solid State Communications, v5 n1 p89-92 1967.

Descriptors: (*Magnetic moments, Surfaces), Ferromagnetism, Interactions, Excitation, Anisotropy, Attenuation, Magnetic fields, Mathematical models.
Identifiers: Spin waves, Magnons, Cubic crystals.

A theoretical investigation has been made of surface spin waves localized at a (001) surface of a ferromagnetic simple cubic lattice with nearest and next-nearest neighbor exchange interactions. The excitations spectrum for the surface spin waves has been obtained and compared with that for bulk spin waves. A discussion is presented of the manner in which the decay of the spin waves from the surface depends on the values of the exchange integrals. The effect of a surface anisotropy field on the surface spin wave excitation spectrum and on the decay from the surface are considered. (Author)
AD-669 646 Not available from CFSTI.

DERIVATION OF THE PRINCIPLE OF COMPENSATION OF DANGEROUS DIAGRAMS.

Scientific Interim rept.,
Uppsala Univ (Sweden) Quantum Chemistry Group
Donald H. Kobe. 14 Sep 66, 13p
AFOSR-68-1068
Contract AF 61 (052)-874
Availability: Published in Journal of Mathematical Physics, v8 n6 p1200-10 1967.

Descriptors: (*Superconductivity, *Quantum mechanics), Transport properties, Fermions, Ground state, Green's function, Sweden.
Identifiers: Compensation of dangerous diagrams, Quasiparticles.

The principle of compensation of dangerous diagrams (PCDD) postulated by Bogoliubov to determine the coefficients in the canonical transformation to quasi-particles in superconducting systems is derived from four different criteria (1) the expected number off quasi-particles in the true ground state is a minimum (2) the one-particle density matrix and the two-particle amplitude determined from the BCS ground state are equated to the true ones, (3) the expectation value of an arbitrary operator is simplified by diagonalizing its quadratic part, and (4) the starting point for the dressing of the quasi-particle is chosen in the most convenient way. The condition obtained for the PCDD is then expressed in terms of quasi-particle Green's functions. The ladder diagrams are eliminated by examining an integral equation for the Green's function describing the creation of two quasi-particles from the vacuum. Finally, the condition obtained here for the PCDD is compared with the condition obtained previously. (Author)
AD-669 669 Not available from CFSTI.

SOME NUMERICAL CALCULATIONS FOR AN ELECTRIC ARC IN A CYLINDRICAL TUBE.
Aeronautical Research Council (Gt. Brit.)
P. F. Hodnett. 16 Oct 67, 13p ARC-29426

Descriptors: *Circular tubes, *Electric arcs, *Pressure distribution, *Temperature distribution, *Volt-ampere characteristics, Electrical resistivity, Heat sinks, Numerical analysis, Thermal conductivity, Thermal plasmas.

For abstract, see STAR 06 12.
N68-22127 HC$3.00 MF$0.65

EXPERIMENTAL STUDY OF SUPERCONDUCTIVITY INDUCED BY PROXIMITY EFFECTS.
Commissariat A L Energie Atomique, Saclay (France).
For primary bibliographic entry see Field 20L.
For abstract, see STAR 06 12.
N68-22902 HC$3.00 MF$0.65

MAGNETIC ANISOTROPY OF CO X FE3 MINUS X O4 FERRITES.
Anisotropie Magnetique des Ferrites Coxfe3minusxo4
Commissariat A L Energie Atomique, Saclay (France).
P. Vigier. Dec 67, 38p CEA-BIB-105
Lang- in French, English Summary

Descriptors: *Anisotropy, *Cobalt compounds, *Ferrites, *Magnetic dipoles, *Spinel, Crystal structure, Ferric ion, Ferrimagnetic materials, Spin-lattice relaxation.

For abstract, see STAR 06 12.
N68-23033 HC$3.00 MF$0.65

BIBLIOGRAPHY OF MAGNETIC MATERIALS AND TABULATION OF MAGNETIC TRANSITION TEMPERATURES.
Oak Ridge National Lab., Tenn.
Mar 68, 62p
Contrac; W-7405-eng-26

Descriptors: (*Magnetic materials, Bibliographies), Transition temperature, Tables.

For abstract, see NSA 22 10.
ORNL-RMIC-7 HC$3.00 MF$0.65

20D. Fluid Mechanics

THE TESTING OF CABLES, WIRES, STRAPS, ETC. (ISPYTANIYA TROSSOV, PROVOLOK, LENT I PR.).
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 14B.
AD-669 162 HC$3.00 MF$0.65

DENSITY DISTRIBUTION IN AN INSTRUMENT IN FREE MOLECULE FLOW (O RASPREDELENII PLOTNOSTI V PRIBORE PRI SVOBODNOMOLEKULYARNOM TECHENII),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 4A.
AD-669 163 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF THE WALL PRESSURE FLUCTUATIONS IN SUBSONIC SEPARATED FLOWS,
Boeing Co Renton Wash Commercial Airplane Div
A. M. Mohsen. 26 Jan 67, 61p Rept no. D6-17094

Descriptors: (*Flow separation, Subsonic characteristics), Aerodynamic configurations, Pressure, Walls, Turbulence, Reynolds number, Boundary layer.
Identifiers: Steps (Aerodynamics), Fences (Aerodynamics).

Experimental measurements of static pressures, fluctuating wall pressures, and mean velocity profiles are presented for subsonic turbulent separated flows. Separation was induced by three types of geometrical configurations: Backward-facing steps 1/2, 1, and 1-1/2 inches high; forward-facing steps 1/2 and 1 inch high; and fences 1/2 and 1 inch high. Measurements were made for free stream velocities of 170, 280, and 370 ft/sec. It was found that the base pressure was essentially Reynolds number independent. The separation length was independent of speed and proportional to the height of the configuration causing flow separation. The wall pressure fluctuations associated with the separated flows were of higher magnitudes than those caused by attached turbulent boundary layers and reached maximum values near reattachment. (Author)
AD-669 214 HC$3.00 MF$0.65

TEST RESULTS FROM THE BOUNDARY LAYER FACILITY - RESPONSE OF STRUCTURE TO THE PSEUDO-SOUND FIELD OF A JET (USING COMBINED CONTINUUM AND FINITE ELEMENT METHOD),
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 215 HC$3.00 MF$0.65

TEST RESULTS FROM THE BOUNDARY LAYER FACILITY (THEORY AND EXPERIMENTAL COMPARISON),
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 217 HC$3.00 MF$0.65

ACOUSTIC SCALING BETWEEN MODEL COLD FLOW AND HOT FLOW JETS.
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 219 HC$3.00 MF$0.65

FLUID DYNAMICS OF ROTOR AND FAN SUPPORTED AIRCRAFT AT SUBSONIC SPEEDS.
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 1C.
AD-669 226 HC$3.00 MF$0.65

TECHNIQUES FOR MEASUREMENT OF DYNAMIC STABILITY DERIVATIVES IN GROUND TEST FACILITIES,
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 14B.
AD-669 227 HC$3.00 MF$0.65

INTERNAL LOW REYNOLDS NUMBER TURBULENT HEAT TRANSFER.
Interim technical rept. no. 2,
Arizona Univ Tucson Energy Mass and Momentum Transfer Lab
Harold C. Reynolds, Jr. Jan 68, 199p Rept no. EMMT-Lab-TR-2
AROD-5403:4-E
Contract DA-31-124-ARO (D)-314

Descriptors: (*Adiabatic gas flow, *Heat transfer), Reynolds number, Turbulence, Equations of motion, Pipes, Velocity, Friction, Air, Helium.

The results of a semi-analytical and experimental study of adiabatic tube flow and an analytical and experimental investigation of the thermal entrance region for gas flowing through electrically heated circular tubes are presented. Emphasis is placed on the low Reynolds number turbulent flow regime--defined as fully turbulent flow at bulk Reynolds numbers from 3,000 to about 15,000. Adiabatic air velocity and friction data and localized heat transfer measurements for air and helium, at low heating rates, are presented for this range. (Author)
AD-669 254 HC$3.00 MF$0.65

CHARACTERISTICS OF THE DYNAMIC CALIBRATION OF AN INSTRUMENT FOR MEASURING THE INSTANTANEOUS TEMPERATURES OF GAS FLOWS (OSOBENNOSTI DINAMICHESKOI TARIROVKI APPARATURY DLYA IZMERENIYA MGNOVENNYKH TEMPERATUR GAZOVYKH POTOKOV),
Foreign Technology Div Wright-Patterson AFB Ohio
D. F. Simbirskii. 24 Aug 67, 11p Rept no. FTD-HT-23-874-67
Edited trans. of Samoletostroenie i Tekhnika Vozhushnogo Flota (USSR) n2 p59-62 1965, by F. Dion.

Descriptors: (*Temperature sensitive elements, Calibration), (*Gas flow, Temperature), Sensors, Inertia, Amplifiers, Corrections, Frequency, USSR.
Identifiers: Translations.

There are several methods of overcoming the thermal inertia of thermocouples and resistance thermometers in measuring the rapidly changing temperatures of gas flows. The report describes a measuring d-c amplifier built on semiconductor triodes. This instrument makes it possible to make automatic corrections of the signal which is always distorted due to the inertia of the sensor. A line diagram of the amplifier-corrector is given. The correcting four-pole component, the time constant of which V sub K = RC, is in the first stage of the amplifier-corrector. The next two stages make it possible to record the corrected signal on a loop oscillograph. The condition for the execution of the correction is the relation V sub K = V sub D, where V sub D is the time constant of the sensor. It is concluded that the employment of the correcting device makes possible the elimination of the thermal inertia effect of the sensor within a broad range of temperature variations. A quantitative evaluation of the effectivity of the employment of the device may be performed either on a calibrated device with P-shaped temperature pulses,

or by analysis of the frequency characteristics of the measuring channel. (Author)
AD-669 271 HC$3.00 MF$0.65

THEORY OF SHOCK WAVES AND INTRODUCTION TO GAS DYNAMICS,
Foreign Technology Div Wright-Patterson AFB Ohio
Ya. B. Zeldovich. 29 Aug 67, 237p Rept no. FTD-HT-66-258
Edited trans. of mono. Theoriya Udarnykh Voln i Vvedenie v Gazodinamiku, Moscow/Leningrad, 1946 186p.

Descriptors: (*Shock waves, Theory), (*Explosions, Aerodynamic characteristics), Problem solving, Sound transmission, Equations of motion, Nozzle gas flow, Supersonic characteristics, Blunt bodies, Adiabatic gas flow, Graphics, Simulation, Propagation, Oscillation, Jet propulsion, Explosion effects, Blast, USSR.
Identifiers: *Gas dynamics, Translations, Pointed bodies.

Gas dynamics is defined as the science of motion at great pressure differentials and high velocities, velocity being measured in terms of the speed of sound. The book confines itself to specific phenomena of gas dynamics, i.e., those which have no analogies in the mechanics of an incompressible liquid. Emphasis is placed on careful definition of the fundamentals of gas dynamics, fundamental laws, and methods of solving simplest problems, rather than on the computational methods of gas dynamics or methods of numerical integration of complex two- and three-dimensional flows, etc. Attention is devoted to problems of flow around bodies moving at great speeds, motion of a gas in ducts such as nozzles and pipes, and compressibility of the moving medium. The second main topic is shock waves considered under the theory of shock waves, shock wave laws, and the problem of the destructive effect of explosions and propagation of the explosion on the explosive substance (capable of chemical reaction). The text is intended to also serve as an introduction to the theory of explosions. (Author)
AD-669 272 HC$3.00 MF$0.65

UNSTEADY FORCE MEASUREMENTS ON FULLY WETTED HYDROFOILS IN HEAVING MOTION,
California Inst of Tech Pasadena
For primary bibliographic entry see Field 13J.
AD-669 289 Not available from CFSTI.

JOURNAL OF ENGINEERING PHYSICS, VOL. 9, NO. 2, 1965 (SELECTED ARTICLES),
Foreign Technology Div Wright-Patterson AFB Ohio
I. S. Makarov, B. G. Khudenko, and M. S. Smirnov. 2 Nov 67, 20p Rept no. FTD-HT-23-854-67
Edited trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v9 n2 p180-6, 250-4 1965, by E. Harter.

Descriptors: (*Jet mixing flow, Nozzle gas flow), (*Transport properties, Differential equations), Nonlinear systems, Heat transfer, Mass transfer, Turbulence, USSR.
Identifiers: Translations.

Contents: System of plane turbulent jets; Nonlinear stationary system of differential equations of heat and mass transfer.
AD-669 312 HC$3.00 MF$0.65

BOUNDARY LAYER ON A CONTINUOUS MOVING PLANE SURFACE (O POGRANICHNOM SLOE NA DVIZHUSHCHEISYA NEPRERYVNOI PLOSKOI POVERKHNOSTI),
Foreign Technology Div Wright-Patterson AFB Ohio
I. I. Ibragimov, V. P. Kashkarov, and A. T. Lukyanov. 20 Oct 67, 14p Rept no. FTD-HT-23-829-67
Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Aviatsionnaya Tekhnika (USSR) n2 p18-25 1965.

Descriptors: (*Boundary layer, *Compressible flow), Velocity, Surfaces, Equations of motion, Nonlinear systems, Thermodynamics, USSR, Difference equations, Mathematical models.
Identifiers: Gas dynamics, Translations.

The paper sets forth a solution to the equations of a plane boundary layer of compressible gas for nonlinear temperature dependence of the viscosity coefficient, as obtained with static electric integrators. (Author)
AD-669 313 HC$3.00 MF$0.65

PRESSURE DISTRIBUTION ON A CONE-CYLINDER-FLARE BODY AT MACH 14 IN THE PRESENCE OF FLOW SEPARATION.
Final rept.,
Aerospace Research Labs Wright-Patterson AFB Ohio
Eric G. Friberg. Feb 68, 61p Rept no. ARL-68-0032

Descriptors: (*Flared afterbodies, *Flow separation), Hypersonic characteristics, Conical bodies, Cylindrical bodies, Pressure, Distribution, Reynolds number, Wind tunnel models, Model tests, Hypersonic planes, Hypersonic test vehicles.
Identifiers: Pressure distribution.

Surface pressure data are presented for a cone-cylinder-flare body with 20 deg and 40 deg flare angles at a nominal freestream Mach number of fourteen. Separation of the flow due to the adverse pressure gradient induced by the flare was found in both cases. Appreciable extent of separation existed in the 40 deg flare case, while for the 20 deg flare separation was less severe. A correlation formula using the viscous interaction parameter is shown to be valid for a wide range of Mach numbers and model geometries. (Author)
AD-669 328 HC$3.00 MF$0.65

ENHANCEMENT OF HEAT AND MASS TRANSFER IN A STAGNATION REGION BY FREE STREAM VORTICITY,
Brown Univ Providence R I
George Williams. Feb 68, 118p*
ARL-68-0022
Contract F33615-67-C-1754, Grant NSF-GK-575

Descriptors: (*Heat transfer, Stagnation point), (*Mass transfer, Stagnation point), (*Vortices, Transport properties), Prandtl number, Equations of motion, Velocity, Boundary layer, Digital computers.
Identifiers: Cross flow, IBM 1130 computers.

Calculations were performed using a mathematical model to show the effect of free-stream turbulence on stagnation-point heat transfer from circular cylinders in cross-flow. The calculations were performed on an IBM 1130 digital computer for a wavelength equal to 5/3 times the neutral wavelength for the flow. This wavelength was obtained from experimental mass transfer results. The Prandtl numbers used in the computations were 0.70, 2.70, 2.85, 3.00, 7.00 and 100, and the amplitude parameter A had the range 0.0 (0.5)3.0. The results of the calculations show that the mean heat transfer at the stagnation point increases with Prandtl number for each value of the amplitude parameter used in the calculations, and that the largest increase occurred for a Prandtl number equal to 100. A method is proposed on how to relate the amplitude parameter A to free-stream turbulence intensity. For a Prandtl number of 2.85, a comparison is made between heat transfer results of the model and experimental mass transfer results. The agreement between results is found to be satisfactory. (Author)
AD-669 330 HC$3.00 MF$0.65

INTERACTION BETWEEN AIR FLOW AND AIRBORNE SOUND IN A DUCT: VOLUME II. ACOUSTIC EXCITATION OF BOUNDARY LAYER AND RADIATION IMPEDANCE OF ORIFICES.
Goettingen Univ (West Germany) Physikalisches Institut
For primary bibliographic entry see Field 20A.
AD-669 358 HC$3.00 MF$0.65

THEORY CALCULATION AND DESIGN OF SUPERCAVITATING PROPELLER.
Bureau D'Analyse Et de Recherche Appliquees Boulogne-Billancourt (France)
For primary bibliographic entry see Field 13J.
AD-669 363 HC$3.00 MF$0.65

SUBSONIC OSCILLATORY OR STEADY AIRLOADS ON WINGS WITH CONTROL SURFACES AND OTHER DISCONTINUITIES.
Stanford Univ Calif Dept of Aeronautics and Astronautics
For primary bibliographic entry see Field 1C.
AD-669 373 HC$3.00 MF$0.65

STUDY OF THE BLUNT-BODY STAGNATION POINT VELOCITY GRADIENT IN HYPERSONIC FLOW,
Arnold Engineering Development Center Arnold Air Force Station Tenn
L. L. Trimmer. May 68, 37p Rept no. AEDC-TR-68-99
Contract AF 40 (600)-1200
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn.

Descriptors: (*Stagnation point, Hypersonic characteristics), (*Aerodynamic heating, Atmosphere entry), Velocity, Blunt bodies, Reentry vehicles, Axially symmetric flow, Mach number, Cylindrical bodies, Models (Simulations), Hemispherical shells, Pressure, Distribution.
Identifiers: Pressure distribution.

Results of an experimental investigation to determine the stagnation point velocity gradients for a family of blunt axisymmetric shapes at hypersonic Mach numbers are presented. Data presented in the form of model pressure distributions and stagnation point Mach number gradients are compared with existing data and theories. Although not accurately predicting the results, Newtonian theory is shown to provide a good basis for data correlation. Variations in model pressure distribution and stagnation point Mach number gradient from free-stream Mach number 6 to 10 were small and essentially within experimental precision. Model bluntness ranged from a hemisphere-cylinder to a flat-nose-cylinder, and data were obtained at free-stream Mach numbers 6, 8, and 10 and a nominal Reynolds number of 1,000,000, based on model diameter. (Author)
AD-669 378 HC$3.00 MF$0.65

GRAPHICAL METHODS IN AEROTHERMODYNAMICS,
Advisory Group for Aerospace Research and Development Paris (France)
O. Lutz, and G. Stoffers. Nov 67, 313p* Rept no. AGARD-ograph-98
NATO Furnished.

Descriptors: (*Aerodynamics, *Graphics), (*Thermodynamics, Aerodynamics), Diagrams, Jet propulsion, Equations of state, Pressure, Volume, Temperature, Heat transfer, Velocity, Gases, Specific heat, Solids, Fuels.
Identifiers: *Aerothermodynamics.

The report is a survey of diagrams and graphical methods used in thermodynamics, especially those that are important in the field of jet propulsion; it is a result of an extensive literature search. Part I deals with changes of state, including the pressure-volume-temperature system, the enthalpy-temperature-entropy system, and diagrams where one of the coordinates depends on composition.

Heat transfer processes are treated in Part II. Part III covers the pressure-velocity diagram for ideal gases and new types of diagram valid, for example, for gases with varying specific heats. The fundamental structure of the diagrams is considered at the beginning of each section and the behaviour of the curves is derived from the basic equations of thermodynamics. The available working diagrams are described and reviewed and details are given of the range of validity, the dimensions of the diagrams and the units used. (Author)
AD-669 416 HC$3.00 MF$0.65

ANALYTICAL INVESTIGATION OF THE INFLUENCE OF VARIABILITY OF THERMOPHYSICAL PROPERTIES OF LIQUID WITH TURBULENT NONISOTHERMAL MOTION IN TUBES (ANALITICHESKOE ISSLEDOVANIE VLIYANIYA PEREMENNOSTI TEPLOFIZICHESKIKH SVOISTV ZHIDKOSTI PRI TURBULENTNOM NEIZOTERMIZESKOM DVIZHENII V TRUBAKII),
Foreign Technology Div Wright-Patterson AFB Ohio
L. I. Kudryashev, and V. K. Lyakhov. 28 Jul 67, 23p Rept no. FTD-MT-24-115-67
Edited machine trans. of Aviatsionnyi Institut, Kuibyshev. Trudy (USSR) n15 p225-36 1963.

Descriptors: (*Fluid flow, *Thermodynamics), Turbulence, Liquids, Pipes, Motion, Heat transfer, Skin friction, Cooling, Mathematical analysis, USSR.
Identifiers: Translations.

Semi-empirical methods are given for incorporating variable thermophysical properties in nonisothermal turbulent flows of various fluids. Derived expressions are applied to a number of flow situations. These include: heat transfer and skin friction for air at Pr approx. = 0.7; liquids such as oils under cooling and heating heat transfer; skin friction of liquids; and, finally, to conditions of near critical heat transfer conditions. All the results correlate well with experiments performed in tubes with the various fluids mentioned above. (Author)
AD-669 418 HC$3.00 MF$0.65

A CRITICAL REVIEW OF ANALYTICAL METHODS FOR ESTIMATING CONTROL FORCES PRODUCED BY SECONDARY INJECTION: THE TWO DIMENSIONAL PROBLEM,
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 21H.
AD-669 445 HC$3.00 MF$0.65

TURBULENT BOUNDARY LAYER CHARACTERISTICS OVER A ROUGH SURFACE IN AN ADVERSE PRESSURE GRADIENT.
Research and development rept.,
Naval Ship Research and Development Center Washington D C Hydromechanics Lab
Victor E. Scottron. Sep 67, 170p
NSRDC-2659
Doctoral thesis.

Descriptors: (*Turbulent boundary layer, Pressure), (*Hydrodynamics, Turbulent boundary layer), Surface properties, Roughness, Ship hulls, Skin friction, Equations of motion, Two-dimensional flow, Walls, Momentum, Velocity, Theses.

The boundary layers produced on rough surfaces in adverse pressure gradients were investigated. Experimental data on two pressure gradients are studied and compared with flow over a smooth surface. Experimental data obtained with both pitot tubes and hot wires are carefully analyzed and corrected for the effects of high level turbulence. An improved pitot tube correction is proposed. It is shown that a boundary layer on a rough wall will separate more readily than on a smooth wall. (Author)
AD-669 486 HC$3.00 MF$0.65

DEVELOPMENT OF A SUPERSONIC NOZZLE MOLECULAR BEAM FACILITY,
California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
For primary bibliographic entry see Field 14B.
AD-669 490 HC$3.00 MF$0.65

INVESTIGATION OF SHORT SUPERSONIC NOZZLES (ISSLEDOVANIE KOROTKIKH SVERKHZVUKOVYKH SOPEL),
Foreign Technology Div Wright-Patterson AFB Ohio
L. V. Gogish. 1 Aug 67, 20p Rept no. FTD-HT-23-1079-67
Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika Zhidkosti i Gaza, n2 p175-80 1966, by J. Stock.

Descriptors: (*Supersonic nozzles, Design), Optimization, Nozzle gas flow, Supersonic flow, Curved profiles, Geometric forms, Thrust, USSR.
Identifiers: Translations.

The article demonstrates experimentally that in nozzle optimization it is more expedient to use nozzles with weak shocks and some overexpansion, obtained by increasing the nozzle contour curvature as compared to that of a truncated perfect nozzle. Tests were conducted with a series of two-dimensional nozzles with a constant contour profile but with various degrees of flow expansion. Measurements were made of the static pressure distribution along the wall of the nozzle supersonic section and of the total pressure at the nozzle exit. The experimentally determined thrust of the nozzle supersonic section with an increased contour curvature was compared with the calculated thrust of the supersonic section of truncated perfect nozzles with uniform characteristics. The obtained results indicate that there is a definite range of nozzle dimensions at which the nozzles with increased contour curvatures are more advantageous than the truncated perfect nozzles. In this case, the contour inclination angle in a nozzle with a shock at the exit cross-section is not equal to zero and the shock effect is small. (Author)
AD-669 526 HC$3.00 MF$0.65

EFFECT ON HEAT EXCHANGE AND FRICTION OF COOLANT SUPPLY IN TURBULENT BOUNDARY LAYER (VLIYANIE NA TEPLOOBMEN I TRENIE PODACHI OKHLADITELEI V TURBULENTNYI POGRANICHNII SLOI),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20M.
AD-669 527 HC$3.00 MF$0.65

THE CHARACTERISTICS OF A THIN LIQUID FILM ON A SPINNING DISK,
Rand Corp Santa Monica Calif
Carl Gazley, Jr., and Andrew F. Charwat. May 68, 23p* Rept no. P-3851
Prepared in cooperation with California Univ., Los Angeles. Presented at the All-Union Conference on Heat and Mass Transfer (3rd), Minsk, 14-18 May 68.

Descriptors: (*Films, *Spin), (*Liquids, Films), Centrifugal fields, Thickness, Disks, Fluid dynamic properties, Equations of motion, Flow visualization, Interfaces, Mass transfer, Surface tension.
Identifiers: *Liquid films.

An experimental study of thin liquid films on a spinning disk is described. Such films are characterized by large values of the ratio of interfacial area to liquid volume, can be formed in very small equipment compared to falling films, and their development is independent of surface orientation to the gravitational field. This makes them interesting for a number of energy and mass transfer processes. The paper summarizes the available numerical and analytical studies of the fluid-mechanical characteristics of spinning films and presents measurements of average film thickness as a function of radial position, liquid flow rate, and rotational speed. In spite of surface-tension phenomena (waves, dry spots, etc.) not accounted for in the theoretical study, the data indicate that the theory predicts the proper relative effects of the several variables. (Author)
AD-669 557 HC$3.00 MF$0.65

ON TURBULENT SHEAR FLOWS OF VARIABLE DENSITY,
Rand Corp Santa Monica Calif
John Laufer. May 68, 42p Rept no. RM-5549-ARPA
Contract DAHC15-67-C-0141, ARPA Order-189-1

Descriptors: (*Turbulent boundary layer, Flow fields), Shear stresses, Turbulence, Density, Equations of motion, Velocity, Compressible flow, Mathematical prediction, Axially symmetric flow, Momentum.
Identifiers: Shear flow.

A study was made of the mean flow field of free turbulent layers of variable density showing that if the velocity distribution in a particular constant-density flow is known, it is possible to obtain the corresponding variable-density velocity field without the introduction of a compressible turbulent viscosity. This is accomplished by a Dorodnitsyn-Howarth type of transformation applied to the time-dependent equations of motion rather than to the mean equations of motion, as has been done previously. When the transformed equations are averaged, using Reynolds' method, the incompressible turbulent equations for the mean flow are obtained. These equations can then be handled by conventional methods. Predictions obtained by this procedure agree well with experimental results. (Author)
AD-669 563 HC$3.00 MF$0.65

DETERMINATION OF TRANSIENT GAS CONSTITUENT CONCENTRATIONS UTILIZING A HIGH ENERGY ELECTRON BEAM.
Arnold Engineering Development Center Arnold Air Force Station Tenn
For primary bibliographic entry see Field 14B.
AD-669 564 HC$3.00 MF$0.65

AN EMPIRICAL CORRELATION OF PRESSURE ON BLUNT-NOSED CYLINDRICAL AFTERBODIES AT HYPERSONIC MACH NUMBERS.
Final rept. Jan 61-Dec 66,
Arnold Engineering Development Center Arnold Air Force Station Tenn
R. H. Eaves, Jr. May 68, 71p Rept no. AEDC-TR-68-82
Contract AF 40 (600)-1200
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn.

Descriptors: (*Afterbodies, Hypersonic characteristics), (*Aerodynamic loading, Distribution), Pressure, Blunt bodies, Cylindrical bodies, Mach number, Correlation techniques, Wind tunnel models, Drag, Mathematical prediction, Model tests, Theses.
Identifiers: Pressure distribution, Method of characteristics.

The study provided a readily solvable correlating equation that accurately predicts the pressure distribution over the afterbodies of various blunt-nosed cylinders at hypersonic Mach numbers. The correlating equation is developed from experimental pressure data on a cylinder with three nose shapes (hemisphere, flat-face, and rounded-shoulder flat-face) at free-stream Mach numbers of 6, 8, and 10. For blunt-nosed cylinders with nose drag coefficients from 0.89 to 1.72, the correlating equation is applicable over an extended experimental range of Mach number from 5.0 to 10.2 for local pressures greater than free-stream pressure. A good correlation is obtained with the method of characteristics solutions for Mach numbers from 5 to 100 for ten nose diameters along the

body, but the applicability of the correlating equation beyond the experimental limits was not demonstrated. (Author)
AD-669 565 HC$3.00 MF$0.65

THE THIN LAYER APPROXIMATION IN HYPERSONIC VISCOUS FLOW THEORY.
Final rept.,
General Research Corp Santa Barbara Calif
J. A. Laurmann. Apr 68, 66p Rept no. GRC-CR-1569-1
AFOSR-68-0742
Contract AF 49 (638)-1569

Descriptors: (*Leading edge, Hypersonic characteristics), Approximation (Mathematics), Viscosity, Equations of motion, Navier-Stokes equations, Slender bodies, Flat plate models, Thermal diffusion, Thickness, Theory.

A suggested thin layer approximation to the Navier-Stokes equations, suitable for hypersonic viscous flow over slender bodies, is solved approximately in a variety of ways for the case of flow over a flat plate at zero incidence. Two methods of solution appear to be most effective: an inner-outer representation for values of the interaction parameter v less than about 1/4; and for larger v, a linearized form of the equations in which the viscous and thermal diffusion rates correspond to the temperature at the plate surface. The result of calculations of the density field made with these two approaches are in approximate agreement with experiment over the major portion of the leading edge flow region. Greatest differences occur at the surface and in the shock region where the neglected nonlinear terms are most important. Theoretical analyses have as yet revealed no disagreement between the predictions of the thin layer hypersonic approximations and experiment--although the former are incomplete and at best approximate. (Author)
AD-669 571 HC$3.00 MF$0.65

VISCOUS, HYPERSONIC FLOW AROUND A BLUNT BODY.
Technical rept.,
Stanford Univ Calif Div of Engineering Mechanics
John E. Kaiser, and I. Flugge-Lotz. Jan 68, 176p
Rept no. TR-178
AFOSR-68-0988
Contract AF 49 (638)-1385

Descriptors: (*Blunt bodies, Hypersonic characteristics), Viscosity, Shock waves, Boundary layer, Reynolds number, Navier-Stokes equations, Difference equations, Problem solving, Superaerodynamics, Continuum mechanics.
Identifiers: Series truncations, *Second order theory.

A simplified form of the Navier-Stokes equations was used to describe the flow in the shock layer of a blunt body. The equations are solved near the axis of the body by using the method of series truncation. The main method of solution is a finite difference method, which in principle allows one to handle axisymmetric bodies of arbitrary shape. The body shape is assumed to be given and the bow shock shape is determined step by step. (Author)
AD-669 578 HC$3.00 MF$0.65

A NUMERICAL SOLUTION FOR THE LAMINAR WAKE BEHIND A FINITE FLAT PLATE.
Technical rept.,
Stanford Univ Calif Div of Engineering Mechanics
Allen Plotkin, and I. Flugge-Lotz. Jan 68, 99p
Rept no. TR-179
AFOSR-68-1018
Contract AF 49 (638)-1385

Descriptors: (*Flat plate models, Laminar flow), (*Laminar flow, Wake), Numerical analysis, Navier-Stokes equations, Equations of motion, Momentum, Two-dimensional flow, Incompressible flow, Thickness, Trailing edge, Reynolds number, Boundary layer, Flow fields, Skin friction.

A numerical solution is presented for the laminar, two-dimensional viscous, incompressible wake behind a finite flat plate. The plate is infinitely thin and is aligned parallel to a uniform stream. The Reynolds number based on plate length is assumed large enough to allow the formation of boundary layers on the sides of the plate. The upstream influence of the trailing-edge disturbance necessitates solving the complete Navier-Stokes equations in the trailing-edge region. The aim of the investigation is to calculate an improved first approximation to the solution in this region for large values of the Reynolds number. The elliptic equations define a boundary-value problem. A finite-difference solution to equations which closely approximate the Navier-Stokes equations is obtained in a rectangular region which includes the trailing edge. A relaxation-type procedure is used. Weighted differences, which combine backward and central differences in equal proportion, are introduced to provide the upstream influence in the scheme. The nonlinear partial differential equations are replaced by linear difference equations and iteration is used until the solutions converge. Solutions are obtained for Reynolds numbers larger than 100,000. A complete description of the flow field is provided in the rectangle and downstream wake except in a very small region surrounding the trailing edge. (Author)
AD-669 581 HC$3.00 MF$0.65

STUDIES OF NITRIC OXIDE CHEMILUMINESCENCE USING BOUNDARY LAYER APPROXIMATIONS.
Final rept. Feb-Dec 67,
Mithras Cambridge Mass
R. Earl Good, Jacques A. F. Hill, and Leonard Silver. Apr 68, 80p Rept no. MC-66-268-R1 (BNX)
AFCRL-68-0143
Contract F19628-67-C-0025

Descriptors: (*Jet mixing flow, *Chemical reactions), (*Upper atmosphere, Analysis), Chemiluminescence, Nitrogen oxides, Oxygen, Reaction kinetics, Boundary layer, Reynolds number, Diffusion, Probes, Photometers.

The interface layer generated when a sonic jet is directed against a supersonic stream was analyzed by means of the boundary-layer equations for stagnation point flow. The gas from the jet is assumed to react chemically with the free-stream gas in a second order reaction. The parameters defining a particular solution are the normalized jet gas blowing rate and a Damkohler number relating the reaction rate to the velocity gradient along the interface layer. Numerical solutions were obtained covering a range of values of both parameters. The results presented emphasize the variation in concentration profiles through the layer as the Damkohler number is changed. They show that as the Damkohler number increases the total reaction between the two streams changes from a rate-controlled to a diffusion-controlled regime. The results were applied to the chemiluminescent reaction NO + O yields NO2 + photon and compared with measurements obtained in a low-density supersonic wind tunnel. The measurements clearly illustrate the transition between the two regimes and yield the bimolecular rate constant $k = 1.6 \times 10$ to the -12th power cc/mole sec. (Author)
AD-669 582 HC$3.00 MF$0.65

SHIP WAVES AT RECREATIONAL BEACHES.
California Univ Berkeley Hydraulic Engineering Lab
J. W. Johnson. Apr 68, 18p† Rept no. HEL-12-7
Contract DA-49-055-CIVENG-65-5

Descriptors: (*Water waves, Ships), (*Beaches, Water waves), (*Recreation, *Safety), (*Swimming, Hazards), Cargo ships, Damage, Velocity, Hydrodynamics, Rivers, Lakes, Drowning.

The report data provide some measure of the heights of waves resulting from the passage of typical ships moving at various speeds near sloping shorelines. The magnitude of such waves when ships travel at relatively high speeds obviously may create hazardous conditions to unobserving users of the shoreline. Floating equipment and docks along a shoreline also are subject to damage. (Author)
AD-669 585 HC$3.00 MF$0.65

SUPERSONIC WIND TUNNEL TESTS OF THE THREE-STAGE TARGET MISSILE ARPAT.
Ballistic Research Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 16D.
AD-669 588 HC$3.00 MF$0.65

CALCULATIONS OF EXPANDING SHOCK WAVES AND LATE-STAGE EQUIVALENCE.
Drexel Inst of Tech Philadelphia Pa
For primary bibliographic entry see Field 19D.
AD-669 645 HC$3.00 MF$0.65

TURBULENT SPECTRAL DATA IN LARGE-SCALE TURBULENT BOUNDARY LAYERS, DEVELOPED OVER DIFFERENT TYPES OF BOUNDARY ROUGHNESS.
Research memo.,
Colorado State Univ Fort Collins Fluid Mechanics Program
C. Y. Liu, V. A. Sandborn, and H. W. Tieleman. Nov 67, 27p Rept no. CEM67-68CYL10
Grant DA-AMC-28-043-65-G-20

Descriptors: (*Turbulent boundary layer, Energy), Surface roughness, One-dimensional flow, Spectroscopy, Passive, Band-pass filters.
Identifiers: *Energy spectra.

Experimental results of the one-dimensional energy spectrum are reported. These data were obtained in the two-dimensional boundary layer developed along the floor of a large wind tunnel. Measurements were made in boundary layers with three different types of boundary roughness. The influence of the boundary roughness on the shape of the energy spectra can be seen from the data. A method is presented to correct the measurements for an error which may arise by using wide band-pass filters. (Author)
AD-669 652 HC$3.00 MF$0.65

SURFACE RECOMBINATION EFFICIENCIES IN FLOWS CONTAINING STEP-FUNCTION INCREASES IN ATOMIC OXYGEN.
Cornell Aeronautical Lab Inc Buffalo N Y
For primary bibliographic entry see Field 7D.
AD-669 655 HC$3.00 MF$0.65

NATURAL CONVECTION FROM HORIZONTAL RECTANGULAR CYLINDERS OF VARIOUS ASPECT RATIOS.
Catholic Univ of America Washington D C Dept of Mechanical Engineering
For primary bibliographic entry see Field 20M.
AD-669 694 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY-BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME I. USER'S MANUAL.
Douglas Aircraft Co., Inc., Long Beach, Calif.
For primary bibliographic entry see Field 1A.
AD-817 158 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME II. PROGRAM FORMULATION AND LISTINGS.
Douglas Aircraft Co., Inc., Long Beach, Calif.

For primary bibliographic entry see Field 1A.
AD-817 159 HC$3.00 MF$0.65

FLOW FIELD COMPUTATIONS FOR BLUNT BODIES IN PLANETARY ENVIRONMENTS (EQUILIBRIUM) FINAL REPORT.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Missile and Space Div.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 06 12.
N68-21858 HC$3.00 MF$0.65

AXISYMMETRIC TWO-PHASE REACTING GAS NONEQUILIBRIUM NOZZLE FLOWS ANALYSIS.
TRW Systems Group, Redondo Beach, Calif.
J. R. Kliegel, and V. Quan. 18 Aug 67, 33p
NASA-CR-92058, TRW-02874-6007-R000
Contract NAS9-4358

Descriptors: *Axisymmetric flow, *Computer programs, *Nozzle flow, *Two phase flow, Chemical reactions, Combustion products, Gaseous rocket propellants, Mathematical models.

For abstract, see STAR 06 12.
N68-21867 HC$3.00 MF$0.65

AN EXPERIMENTAL INVESTIGATION OF WALL INTERFERENCE EFFECTS ON DYNAMIC MEASUREMENTS ON HALF-MODELS IN VENTILATED TUNNELS THROUGH THE TRANSONIC SPEED RANGE.
National Physical Lab., Teddington (England). Aerodynamics Div.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 06 12.
N68-21903 HC$3.00 MF$0.65

INCIDENCE AND LEADING EDGE EFFECTS ON FLOW AROUND A FLAT PLATE AT MACH NUMBER 18.
Centre National de La Recherche Scientifique, Meudon (France). Laboratoire D'aerothermique.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 06 12.
N68-22012 HC$3.00

AN ANALYTICAL STUDY OF THE MEASURED WALL PRESSURE FIELD UNDER SUPERSONIC TURBULENT BOUNDARY LAYERS.
Tracor, Inc., Rockville, Md.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 06 12.
N68-22087 HC$3.00 MF$0.65

FLOW LOSSES IN FLEXIBLE HOSE, VOLUME I FINAL REPORT.
Louisiana State Univ., New Orleans.
J. R. Langley, and K. L. Riley. Sep 66, 79p
NASA-CR-62061
Contract NAS9-4630

Descriptors: *Fluid flow, *Gas flow, *Hoses, *Performance prediction, *Pressure drop, Compressing, Flexibility, Flow resistance, Friction drag, Manometers, Pressure gages, Pumps, Reynolds number.

For abstract, see STAR 06 12.
N68-22097 HC$3.00 MF$0.65

EFFECTS OF SHOCK IMPINGEMENT AND OTHER FACTORS ON LEADING-EDGE HEAT TRANSFER.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 20M.
For abstract, see STAR 06 12.
N68-22118 HC$3.00 MF$0.65

NEGATIVE ENTRAINMENT IN TURBULENT SHEAR FLOW.
National Physical Lab., Teddington (England). Aerodynamics Div.
P. Bradshaw. 14 Oct 67, 13p NPL-AERO-1249, ARC-29546

Descriptors: *Entrainment, *Shear flow, *Turbulent boundary layer, Energy transfer, Pressure gradients, Reynolds number, Shear stress, Sinks.

For abstract, see STAR 06 12.
N68-22126 HC$3.00 MF$0.65

EFFECT OF AN EXTERNAL VORTEX ON THE BOUNDARY LAYER AT AN AXISYMMETRIC STAGNATION POINT.
Effet D'un Tourbillon Exterieur Sur La Couche Limite en Un Point Diarret de Revolution
Office National D Etudes Et de Recherches Aerospatiales, Paris (France).
G. Kretzschmar. 1967, 24p ONERA-TP-507
Lang- in French, English Summary Conf- Presented At the Agard Meeting on Numerical Methods for Viscous Flows, Teddington, Gt. Brit., 18-21 Sep. 1967 Subm- Submitted for Publication

Descriptors: *Boundary layers, *Stagnation point, *Vortices, Axisymmetric flow, Displacement, Hypersonic flow, Rheoelectrical simulation, Wall temperature.

For abstract, see STAR 06 12.
N68-22149 HC$3.00 MF$0.65

A COMPUTER PROGRAM FOR NON-EQUILIBRIUM CONVERGENT-DIVERGENT NOZZLE FLOW.
National Physical Lab., Teddington (England). Aerodynamics Div.
K. C. Lapworth, D. Schofield, and J. L. Wilson. 20 Oct 67, 21p ARC-29246, NPL-AERO-1250

Descriptors: *Computer programs, *Convergent-divergent nozzles, *Nonequilibrium flow, *Nozzle flow, Diatomic gases, Flow equations, Molecular relaxation, Nitrogen, Nozzle geometry, One dimensional flow, Relaxation time, Supersonic flow, Temperature distribution.

For abstract, see STAR 06 12.
N68-22155 HC$3.00 MF$0.65

HEAT TRANSFER CALCULATIONS FOR THE CONSTANT PROPERTY TURBULENT BOUNDARY LAYER AND COMPARISONS WITH EXPERIMENT.
Aeronautical Research Council (Gt. Brit.)
F. A. Dvorak, and M. R. Head. 5 Dec 67, 36p ARC-29716

Descriptors: *Flow equations, *Heat transfer coefficients, *Thermal boundary layer, *Turbulent boundary layer, Free flow, Heat measurement, Prandtl number, Pressure gradients, Stream functions (fluids), Velocity distribution, Wall flow, Wall pressure, Wall temperature.

For abstract, see STAR 06 12.
N68-22156 HC$3.00 MF$0.65

FUNDAMENTAL EXPERIMENTAL RESEARCH ON SEPARATED FLOWS AND SOME APPLICATIONS THEREOF.
Recherches Experimentales Fondamentales Sur les Ecoulements Separes Et Applications
Office National D Etudes Et de Recherches Aerospatiales, Paris (France).
J. Delery, J. Mirande, and M. Sirieix. 1967, 28p ONERA-TP-520
Lang- in French Conf- Presented At 8th Polish Synp. on Fluid Dyn., Tarda, Poland, 18-23 Sep. 1967 Subm- Submitted for Publication

Descriptors: *Boundary layers, *Separated flow, *Turbulent flow, Afterbodies, Bodies of revolution, Convergence, Flat surfaces, Jet mixing flow, Jet nozzles, Reattached flow, Settling.

For abstract, see STAR 06 12.
N68-22165 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF CONTAINMENT IN CONSTANT-TEMPERATURE RADIAL-INFLOW VORTEXES.
United Aircraft Corp., East Hartford, Conn.
J. S. Kendall. May 68, 49p NASA-CR-1029, F-910091-15
Contract NASW-847
Coll- 49 P Refs

Descriptors: *Containment, *Dynamic characteristics, *Gas flow, *Hilsch tubes, *Inlet flow, *Vortex breakdown, Bypasses, Flow velocity, Helium, Iodine, Turbulent diffusion, Turbulent mixing, Vortex injectors.

For abstract, see STAR 06 12.
N68-22200 HC$3.00 MF$0.65

HYPERVELOCITY HEAT TRANSFER STUDIES IN SIMULATED PLANETARY ATMOSPHERES, APPENDIX FINAL REPORT.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Sciences Lab.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 06 12.
N68-22229 HC$3.00 MF$0.65

FORMULATION OF A METHOD FOR PREDICTING COUPLED CONVECTIVE AND RADIATIVE HEAT TRANSFER ABOUT A BLUNT BODY.
Lockheed Missiles and Space Co., Huntsville, Ala.
For primary bibliographic entry see Field 20M.
For abstract, see STAR 06 12.
N68-22403 HC$3.00 MF$0.65

INVISCID FLOW FIELD INDUCED BY A ROTOR IN GROUND EFFECT.
Therm Advanced Research, Inc., Ithaca, N. Y.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 06 12.
N68-22475 HC$3.00

THE LAMINAR BOUNDARY LAYER ON AN INCLINED CONE.
Aeronautical Research Council (Gt. Brit.)
J. C. Cooke. Aug 65, 20p ARC-T+M-3530, RAE-TN-65178
Subm- Submitted for Publication

Descriptors: *Boundary layer flow, *Conical bodies, *Finite difference theory, *Incompressible flow, *Laminar boundary layer, Equations of motion, Partial differential equations, Slender bodies, Three dimensional flow.

For abstract, see STAR 06 12.
N68-22653 HC$3.00 MF$0.65

ANEW TWO-PARAMETER FAMILY OF MEAN VELOCITY PROFILES FOR INCOMPRESSIBLE TURBULENT BOUNDARY LAYERS ON SMOOTH WALLS.
Aeronautical Research Council (Gt. Brit.)
B. G. Thompson. 1967, 64p ARC-R+M-3463, ARC-26830

Descriptors: *Flow distribution, *Incompressible flow, *Turbulent boundary layer, *Velocity distribution, *Wall flow, Mathematical models, Shear stress, Skin friction, Surface roughness.

For abstract, see STAR 06 12.
N68-22654 HC$3.00 MF$0.65

SIMILARITY STUDIES ON THE RADIATIVE GAS DYNAMIC EQUATIONS.
Case Inst. of Tech., Cleveland, Ohio.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 06 12.
N68-22711 HC$3.00 MF$0.65

DISCHARGE OF SATURATED WATER FROM LONG DUCTS.
Japan Society of Mechanical Engineers, Tokyo.
E. Ogasawara. Oct 67, 13p AEC-TR-6928
Tran- Transl. Into English From Nippon Kikai Gakkai Rombunshu (Tokyo), V. 33, 1967 P 121-124 Conf- Presented At the 70th Ann. Meeting, Tokyo, Oct. 1967

Descriptors: *Fluid dynamics, *Slip flow, *Thermodynamics, *Two phase flow, *Water flow, Drainage, Ducted flow, Pipes (tubes), Pressure drop.

For abstract, see STAR 06 12.
N68-22790 HC$3.00 MF$0.65

FLOW LOSSES IN FLEXIBLE HOSE SUMMARY REPORT.
Louisiana State Univ., Baton Rouge.
Sep 66, 12p NASA-CR-62062
Contract NAS9-4630

Descriptors: *Coefficient of friction, *Flow equations, Correlation coefficients, Flow distribution, Flow geometry, Hoses, Predictions, Temperature distribution, Temperature measurement.

For abstract, see STAR 06 12.
N68-22859 HC$3.00 MF$0.65

SURVEY OF THE GERMAN MARKET FOR AMERICAN FLUID POWER EQUIPMENT,
Cohrssen (Hans) (Germany).
For primary bibliographic entry see Field 5E.
PB-177 847 HC$3.00 MF$0.65

BLADE DESIGN OF FRANCIS TURBINES FOR ENSURING HIGH ANTICAVITATION PROPERTIES (PROFILIROVANIE LOPASTI RADIALNO-OSEVOI GIDROTURBINY IZ USLOVIYA OBESPECHENIYA VYSOKIKH ANTIKAVITATSIONNYKH KACHESTV),
National Science Foundation, Washington, D. C.
Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 10A.
TT-67-59003 HC$3.00 MF$0.65

COMPENDIUM OF SHOCK WAVE DATA,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 19D.
For abstract, see NSA 22 10.
UCRL-50108-Vol-1-Suppl-1 HC$3.00 MF$0.65

COMPENDIUM OF SHOCK WAVE DATA,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 19D.
For abstract, see NSA 22 10.
UCRL-50108-Vol-2-Suppl-1 HC$3.00 MF$0.65

20E. Masers and Lasers

STUDIES ON HIGH POWER GaAs LASERS.
Semiannual technical summary rept. no. 3, 31 May-31 Dec 64,
IBM Watson Research Center, Yorktown Heights, N. Y.
R. S. Title. Dec 64, 37p
Contract Nonr-4136 (00)

Descriptors: (*Lasers, Materials), (*Gallium arsenides, *Crystal growth), Diodes, Electric currents, Diffusion, X-ray diffraction analysis, Impurities, Semiconductor devices.
Identifiers: *Semiconductor lasers.

An evaluation was made of GaAs laser material grown ty the Czochralski method and by the horizontal Bridgman technique. Although the best of the Czochralski grown material is as good as that grown by the horizontal Bridgman method, the Bridgman grown material shows far less variability in performance from crystal to crystal than does the Czochralski grown material. Material grown by the Bridgman technique will be used for the remainder of this project. The studies of factors that influence high operation of GaAs lasers has continued. The influence of the geometry on laser performance is considered and theoretical and experimental data are given. Attempts to characterize laser material over smaller dimensions have continued and progress in this effort is reported. (Author)
AD-455 750 HC$3.00

MEASUREMENT OF THE COEFFICIENTS OF COHERENT AMPLIFICATION OF NEON LINES IN A HELIUM-NEON MIXTURE (IZMERENIE KOEFFITSIENTOV KOGERENTNOGO USILENIYA LINII NEONA V SMESI GELII-NEON),
American Meteorological Society Boston Mass
F. A. Korolev, and Fan-Van-Tkhik. Jun 66, 9p Rept no. T-R-605
Contract AF 19 (628)-3880
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR), n6 p75-9 1965, by David Kraus.

Descriptors: (*Gas lasers, *Line spectrum), (*Neon, Gas lasers), Atomic energy levels, Helium, Coherent radiation, Electron transitions, Gain, USSR.
Identifiers: Translations.

A new method is proposed for verifying amplification. Further, the coefficient of amplification of line 6328 A is compared with other lines, whose amplification have been determined. It was found that, in general, lines with 3s-2p and 4d-3p transitions experience amplification, which is in full agreement with previous research.
AD-669 194 HC$3.00 MF$0.65

Pb (1-x)Sn (x)-SALT DIODE LASERS.
Meeting speech,
Massachusetts Inst of Tech Lexington Lincoln Lab
Jack F. Butler. 1967, 4p Rept no. MS-2049
ESD-TR-68-64
Contract AF 19 (628)-5167
Availability: Published in NEREM Record nIEEE-F-85 p30-1 1967.

Descriptors: (*Semiconductor devices, *Lasers), Diodes (Semiconductor), Lead compounds, Tin compounds, Tellurides, Selenides, Solid solutions, Doping, Emissivity, Spectra (Infrared).
Identifiers: *Semiconductor lasers, Lead stannoselenides, Lead stannoselenides.

Injection lasers covering the wavelength range from 6.5 microns to beyond 18.7 microns have been fabricated from Pb (1-x)Sn (x)Se and Pb (1-x)Sn (x)Te. Power and efficiency measurements at 77K and 12K are discussed. Fabrication is based on 'doping' with deviations from stoichiometric composition. (Author)
AD-669 223 Not available from CFSTI.

THEORETICAL STUDY OF THE INTERACTION OF RADIATION AND MATTER IN GASEOUS AND SOLID LASERS.
Final rept. 1 Feb 66-31 Jan 68,
Boston Univ Mass Dept of Physics
Charles R. Willis. 23 Feb 68, 13p
AFCRL-68-0108
Contract AF 19 (628)-5761
Availability: Published in various journals.

Descriptors: (*Lasers, Quantum mechanics), Gas lasers, Atomic energy levels, Quantum statistics, Kinetic theory, Pumping (Optical), Doppler effect, Coherent radiation, Equations of motion, Interactions.
Identifiers: Quantum electronics, Boltzmann equation.

The previous work on the description and understanding of laser behavior from a fundamental microscopic point of view has been extended. The model consists of N stationary or moving two-level systems interacting with radiation in the presence of dissipation and pumping. Radiation-matter correlations, spatial effects, coherence, photon-counting experiments and higher order effects of the radiation field have been examined. This report consists mainly of the abstracts of four articles dealing with these subjects that have appeared or will appear in The Physical Review. (Author)
AD-669 280 Not available from CFSTI.

LIGHT - DETECTOR AND WEAPON,
Foreign Technology Div Wright-Patterson AFB Ohio
V. Krasnov. 13 Nov 67, 92p Rept no. FTD-HT-23-809-67
Unedited rough draft trans. of mono. Svet - Lokator, Svet - Oruzhie, Moscow, 1964 p1-103.

Descriptors: (*Lasers, USSR), Quantum mechanics, Visibility, Coherent radiation, Instrumentation, Ruby, Pulse systems, Gas lasers, Pumping (Optical), Demodulation, Mars (Planet), Communication equipment, Gyroscopes, Predictions.

A beam of light from a quantum generator is a million times brighter than the sun at the same solid angle. Having a high concentration of energy, the beam of a quantum generator can easily pierce a thick metal plate, even a diamond. Focused into a needle beam, the weapon becomes a deadly weapon. Using the beams of a quantum generator, direct communication with the planets and the stars can be achieved. Successful experiments with light-communications have been conducted on Earth. Quantum generators can be used also as optical locators. In range and accuracy they are far better than radar. In 1962 optical detection of the Moon was made. It became possible to examine in detail the lunar surface and, in the future, other planets of the solar system. The tremendous density of the energy of the new beams permit their wide use in various technologies. (Author)
AD-669 305 HC$3.00 MF$0.65

SOME RECENT WORK ON COHERENCE PROPERTIES OF PHOTON BEAMS,
Rochester Univ N Y Dept of Physics and Astronomy
For primary bibliographic entry see Field 20F.
AD-669 317 Not available from CFSTI.

COHERENCE AND PROPERTIES OF THE RIGHT EIGENSTATES OF THE ANNIHILATION OPERATOR.
Aerospace Corp San Bernardino Calif San Bernardino Operations
For primary bibliographic entry see Field 20F.
AD-669 380 HC$3.00 MF$0.65

STUDY OF EMISSION SPECTRA BY PHASE-DISCRIMINATION METHODS.
Ohio State Univ Research Foundation Columbus
For primary bibliographic entry see Field 7D.
AD-669 381 HC$3.00 MF$0.65

INSTRUMENTATION FOR TIME-RESOLVED MASS SPECTROMETRY APPLICATION TO LASER-VAPORIZATION OF SOLID MATERIALS,
Naval Radiological Defense Lab San Francisco Calif
For primary bibliographic entry see Field 14B.
AD-669 453 HC$3.00 MF$0.65

MODULATION AND DETECTION OF COHERENT OPTICAL RADIATION.
Illinois Univ Urbana Dept of Electrical Engineering
For primary bibliographic entry see Field 20F.
AD-669 575 HC$3.00 MF$0.65

A DIFFERENTIAL METHOD FOR THE MEASUREMENT OF ATTENUATION OF PULSED LASER BEAMS.
Memorandum rept.,
Ballistic Research Labs Aberdeen Proving Ground Md
Jeffery Steln, and Mitchell Tress. Jan 68, 25p
Rept no. BRL-MR-1895

Descriptors: (*Coherent radiation, Attenuation), (*Aerosols, Coherent radiation), Measuring devices (Electrical + electronic), Performance (Engineering), Calibration, Lasers, Air pollution.
Identifiers: Pulsed operation, Atmospheric attenuation.

A differential transformer system has been developed to measure the attenuation of short-duration, high-energy laser pulses in a contaminated atmosphere. Photodiodes at each terminus of the laser path produce electrical pulses which are proportional to the laser beam energy. These pulses are applied to opposite sides of the transformer primary and cause a difference signal to appear across the secondary winding. The difference signals can be resolved for input signals of magnitudes as high as several hundred volts and of durations as short as twenty nanoseconds. With an input reference signal of fifty volts, the measurement of the difference signal is accurate to within 0.3 db in attenuation. Precision is limited by oscilloscope resolution. (Author)
AD-669 587 HC$3.00 MF$0.65

BROADBAND LASER DISPLAY SYSTEM.
Army Electronics Command Fort Monmouth N J
For primary bibliographic entry see Field 20F.
AD-669 607 HC$3.00 MF$0.65

LASER TELEMETER FOR ARTILLERY PIECE.
ITT Avionics Nutley N J
For primary bibliographic entry see Field 9F.
AD-669 627 HC$3.00 MF$0.65

MOLECULAR LASERS FOR THE FAR INFRARED.
les Lasers Moleculaires en Infra-rouge Lointain Commissariat A L Energie Atomique, Saclay (France).
D. A. Degras. 8 May 68, 24p CEA-BIB-108
Lang- in French, English Summary

Descriptors: *Far infrared radiation, *Infrared lasers, *Laser outputs, *Molecular oscillators, Gas dissociation, Gas lasers, Laser modes, Molecular interactions, Q switched lasers.

For abstract, see STAR 06 12.
N68-22817 HC$3.00 MF$0.65

THE HOLLOW CATHODE DISCHARGE APPLIED TO LASER DESIGN.
Case Inst. of Tech., Cleveland, Ohio.
W. B. Johnson, and T. F. Trost. 1968, 63p
NASA-CR-94391, A-46
Grants NSG-198, NSG/T/-42

Descriptors: *Copper, *Gas discharge tubes, *Iron, *Lasers, *Tube cathodes, Glow discharges, Metal vapors, Sputtering.

For abstract, see STAR 06 12.
N68-22913 HC$3.00 MF$0.65

FREQUENCY SHIFTS INHERENT IN THE 6328 A HELIUM-NEON LASER.
Case Western Reserve Univ., Cleveland, Ohio.
W. B. Johnson, and T. P. Sosnowski. Nov 67, 79p
NASA-CR-94394, A-57
Grant NSG-198
Spon- Sponsored in Part By Arpa and Goodyear Aerospace Corp.

Descriptors: *Frequency shift, *Frequency stability, *Gas discharge tubes, *Gas lasers, Atomic collisions, Doppler effect, Gas pressure, Helium, Neon.

For abstract, see STAR 06 12.
N68-22935 HC$3.00 MF$0.65

20F. Optics

AN UNDERWATER TRANSMISSOMETER FOR OCEAN SURVEY WORK.
Technical rept.,
Scripps Institution of Oceanography San Diego Calif Visibility Lab
Theodore J. Petzold, and Roswell W. Austin. Apr 68, 9p Rept no. SIO Ref-68-9
Contract NObsr-95251
Presented at the Underwater Photo-Optical Instrumentation Applications Seminar sponsored by the Society of Photo-Optical Instrumentation Engineers and the Naval Undersea Warfare Center.
Availability: It will be included in its present form in the published proceedings of this seminar.

Descriptors: (*Oceanology, Underwater light), Light transmission, Optical properties, Visibility, Optical instruments, Collimators, Particle beams, Attenuation, Design, Underwater equipment, Electrical properties, Stability, Scattering.
Identifiers: *Transmissometers.

A transmissometer developed at the Visibility Laboratory, University of California at San Diego is described. This instrument is capable of being operated by nontechnical persons with little instruction. No compromise has been made in the precision of measurement to obtain the design objectives which include ease of operation, low maintenance, and reliability. The optical system, which has a cylindrically limited beam rather than a collimated source of light, is discussed. (Author)
AD-669 232 Not available from CFSTI.

INTERFACIAL REFLECTANCE.
Final rept.,
Army Coating and Chemical Lab Aberdeen Proving Ground Md
Arthur B. Krewinghaus. Apr 68, 22p* Rept no. CCL-249

Descriptors: (*Light, Reflection), (*Light transmission, Interfaces), Snell's law, Refractive index, Absorption, Diffusion, Reflectivity, Paints.
Identifiers: Graphs (Charts).

The reflection which occurs at optical interfaces is reviewed. The discussion includes the reflection which occurs at the interface between two absorbing media. Diffuse illumination and diffuse reflectance are discussed. (Author)
AD-669 242 HC$3.00 MF$0.65

SINGLE MIRROR NORMAL INCIDENCE REFLECTOMETER.
Revised ed.,
Frankford Arsenal Philadelphia Pa Pitman-Dunn Research Labs
R. J. Esposito, F. Rothwarf, and S. Kozul. 30 Jun 67, 6p
FA-A67-21
Revision of report dated 8 Feb 67.
Availability: Published in The Review of Scientific Instruments, v38 n11 p1573-4 Nov 1967.

Descriptors: (*Reflectometers, Ultraviolet radiation), Performance (Engineering), Experimental design, Mirrors, Reflectivity, Vacuum apparatus.

An inexpensive single mirror reflectometer for specular reflectivity studies at nearly normal incidence is described. This design minimizes errors in the reflectivity which may occur as a result of spatial variations in both the detector sensitivity and the mirror reflectivity. The reflectometer has been successfully used for reflectivity measurements from 2 to 22 eV in a detector-sample chamber which is coupled to a McPherson vacuum ultraviolet monochromator. (Author)
AD-669 296 Not available from CFSTI.

SOME RECENT WORK ON COHERENCE PROPERTIES OF PHOTON BEAMS,
Rochester Univ N Y Dept of Physics and Astronomy
L. Mandel. Apr 68, 29p Rept no. Scientific-8
AFCRL-68-0190
Contract AF 19 (628)-5052
Availability: Published in Proceedings of the Symposium on Modern Optics at Polytechnic Institute of Brooklyn, v17 p143-65 1967.

Descriptors: (*Photons, *Coherent radiation), Particle beams, Light, Photoelectric effect, Lasers, Spectroscopy, Interferometers, Counting methods, Correlation techniques, Statistical mechanics, Reviews.
Identifiers: *Photon beams.

The manner in which certain coherence properties of light are manifest in photoelectric counting measurements is reviewed. Among other things, the measurements are well suited to the study of differences between light from thermal and laser sources. The equations governing the various measurements are derived, and some recent experiments on coherence properties of photon beams are outlined. (Author)
AD-669 317 Not available from CFSTI.

LABORATORY SIMULATION OF LUNAR LUMINESCENCE WITH SPECIAL REFERENCE TO METEORITIC MATERIAL.
Manchester Coll of Science and Technology (England) Dept of Physics
For primary bibliographic entry see Field 3A.
AD-669 327 HC$3.00 MF$0.65

INTENSITY OF RADIATION FROM A RAYLEIGH-SCATTERING ATMOSPHERE,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 3B.
AD-669 343 HC$3.00 MF$0.65

COHERENCE AND PROPERTIES OF THE RIGHT EIGENSTATES OF THE ANNIHILATION OPERATOR.
Rept. for Jun-Nov 67,
Aerospace Corp San Bernardino Calif San Bernardino Operations
Michael T. Tavis. Feb 68, 58p Rept no. TR-0158 (S3816-88)-1
SAMSO-TR-68-205
Contract F04695-67-C-0158

Descriptors: (*Photons, Counting methods), (*Coherent radiation, Quantum mechanics), Coincidence counting, Correlation techniques, Statistical functions, Integral transforms, Hypergeometric functions, Transformations (Mathematics), Hamiltonian, Electromagnetic fields.
Identifiers: Maxwells equations, Quantum optics, Optical coherence, Optical noise.

The report reviews some of the more recent quantum mechanical aspects of photon counting, optical coherence, and the space-time correlation of a lightbeam. The coherent states of the radiation field are defined in terms of the photon number states, and it is seen that these coherent states are the best ones to describe a classical radiation field, in that photon number and phase have an exact compromise for these states. A short discussion of the phase state is given. Many properties of the coherent state are described, and the density matrix for a mixed coherent and noise field in the photon number representation is given. (Author)
AD-669 380 HC$3.00 MF$0.65

RAMAN EFFECT OF MULTIPLE RADIATION PROCESS AND ITS APPLICATIONS IN SPECTROSCOPY,
Foreign Technology Div Wright-Patterson AFB Ohio
Yin-yuan Li. 25 Aug 67, 23p Rept no. FTD-HT-66-496
Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v20 n2 p164-72 1964.

Descriptors: (*Raman spectroscopy, Photons), Lasers, Coherent radiation, Electron transitions, Selection rules, Pumping (Optical), Rayleigh scattering, China.
Identifiers: Translations.

It may become possible to observe the third-order process of radiation in the strong electromagnetic field of a laser beam with two photons absorbed and a third one emitted during a transition between energy levels of a material system. This process is analogous to the ordinary Raman effect, in which only two photons are involved. A theoretical analysis is given and the conclusion reached that with a beam intensity of 0.1 MW/sq cm, the vibrational Raman spectrum of molecules or crystals may be obtained by the three-photon process. It is shown that this effect actually offers a new spectroscopic method. Its importance lies in the difference of the selection rule of this effect and that of the infrared absorption and the ordinary Raman effect. It is also pointed out that the stimulated radiation of three-photon Raman effect may be realized when pumped with a powerful laser beam. (Author)
AD-669 428 HC$3.00 MF$0.65

THE APPLICATION OF A COLOR-CORRECTION FACTOR IN THE PHOTOMETRY OF COLORED SIGNAL LIGHTS (A PROPOSED PROCEDURE),
Naval Ship Research and Development Center Annapolis Md Annapolis Div
George K. C. Hardesty, and T. O. Twist. May 68, 39p
NSRDC-125/68

Descriptors: (*Photometers, Corrections), Colorimetry, Illumination, Display systems, Response, Indicator lights, Colors, Optical filters, Photomultipliers, Analysis, Calibration, Standards, Radiometers.
Identifiers: Spectroradiometry.

This note presents a proposed procedure for assessing errors and applying corrections in the photometry of colored signal lights and various other luminous visual displays. The procedure is primarily for use with the photomultiplier-telephotometer types of luminance measuring equipments in general use today. It is also suitable for the correction of barrier-layer-cell and other solid-state photoreceptor photometric equipment. The spectral response of the complete photometer (not merely the built-in filter and photomultiplier combination) is first determined. Should the overall response prove to be virtually that of the Commission Internationale de l'Eclairage luminosity function, then no 'color corrections' would be applied. Should the spectral response of the photometer system have significant departures from the Commission Internationale de l'Eclairage curve, then valid corrections require radiometric analysis of the spectral energy distribution of the colored light signal and of the 'white light' source used for standardization of the photometer. Appendix A describes a developmental 'Spectral Response Evaluator.' (Author)
AD-669 454 HC$3.00 MF$0.65

ENVIRONMENTAL FACTORS AFFECTING THE PERFORMANCE OF INFRARED CO2 ANALYZER AND THE ESTIMATION OF ALVEOLAR CO2 TENSION.
Naval Aerospace Medical Inst Pensacola Fla
For primary bibliographic entry see Field 7D.
AD-669 458 HC$3.00 MF$0.65

ABSORPTION BY CO2 BETWEEN 3100 AND 4100 cm-1 (2.44-3.22 MICRONS).
Scientific rept.,
Philco-Ford Corp Newport Beach Calif Aeronutronic Div
Darrell E. Burch, David A. Gryvnak, and Richard R. Patty. 30 Apr 68, 34p Rept no. U-4132
Contract Nonr-3560 (00), ARPA Order-237

Descriptors: (*Infrared radiation, Carbon dioxide), (*Carbon dioxide, Absorption), (*Molecular spectroscopy, Carbon dioxide), Molecular energy levels, Pressure, Impurities, Water vapor, Errors, Experimental data, Band spectrum.
Identifiers: Graphs (Charts).

The absorption by CO2 between 3100 and 4100 cm-1 has been studied with a spectrometer whose spectral slitwidth was approximately one-half cm-1. Spectral curves were obtained for 26 samples of CO2 and CO2 + N2 with pressures as high as 14.6 atmospheres and with paths as long as 933 meters. Several absorption bands not observed previously in laboratory spectra have been identified and the strengths of several bands have been determined. Absorption between 3770 and 4100 cm-1 by the extreme wings of strong lines at lower wavenumbers has been investigated for self-broadened and N2-broadened lines. Spectral curves and extensive tables have been included for most of the samples. (Author)
AD-669 468 HC$3.00 MF$0.65

INVESTIGATION OF STIMULATED RAMAN SCATTERING.
Technical rept.,
Minnesota Univ Minneapolis Dept of Electrical Engineering
Audun Hordvik, and R. J. Collins. Apr 68, 203p Rept no. TR-6
Contract Nonr-710 (61)

Descriptors: (*Coherent radiation, *Raman spectroscopy), Lasers, Molecular energy levels, Light, Scattering, Focusing, Carbon compounds, Sulfides, Gain, Electron transitions, Emissivity, Theses.
Identifiers: *Raman scattering, Self-focusing systems, Stokes emission, Antistokes emission, Carbon disulfide.

The connection between stimulated Raman scattering and self-focusing was investigated both theoretically and experimentally. Special attention was given to (1) an explanation of the simultaneous occurrence of several order Stokes and anti-Stokes radiation and (2) an anomalous time behavior, which was found to be present, in the higher order Stokes and 1st anti-Stokes radiation, especially in carbon disulfide. The first phenomenon is explained by introducing a distribution of filament lengths, and good agreement is obtained between theory and experiment. It is suggested that the time anomaly is caused by dielectric breakdown, and numerical calculations are carried out showing qualitative agreement with the observed data. (Author)
AD-669 504 HC$3.00 MF$0.65

OPTIMIZATION OF AN X-BAND INTERFEROMETER FOR PLASMA DIAGNOSTICS.
University Coll Cork (Ireland) Dept of Electrical Engineering
For primary bibliographic entry see Field 20I.
AD-669 552 Not available from CFSTI.

ELECTRICAL PROPERTIES OF MATERIALS IN THE FAR INFRARED REGION.
Final rept.,
Illinois Univ Urbana Electro-Physics Lab
Paul D. Coleman, and Roberto Roldan. 1 Feb 68, 19p
AFOSR-68-0465
Grant AF-AFOSR-272-65

Descriptors: (*Infrared spectroscopy, Monochromators), Materials, Spectra (Infrared), Electrical properties, Vacuum apparatus, Design, Optical properties, Mirrors, Diffraction gratings, Resolution, Detectors, Carbon, Bolometers, Scattering, Intensity, Calibration.

A vacuum monochromator for the 80 to 1,000 micron range, under construction for the past year is described. Initial data on the rotational spectra of HCl, HBr, N2O, CH3Cl and CH3CN were taken to test the performance characteristics of the instrument. Performance data indicated that the monochromator characteristics are: (a) Wavelength reproduction 0.1%; (b) Wavelength calibration 0.5%; (c) Relative intensity measurement 5 to 10%; and (d) A resolution of 2% in the 300 to 700 microns range using a carbon bolometer detector and a scan time of 1 hour. (Author)
AD-669 573 HC$3.00 MF$0.65

MODULATION AND DETECTION OF COHERENT OPTICAL RADIATION.
Final rept. 1 Feb 65-31 Jan 67,
Illinois Univ Urbana Dept of Electrical Engineering
Don F. Holshouser, and O. L. Gaddy. 15 Feb 67, 7p
AFOSR-68-0266
Grant AF-AFOSR-390-65

Descriptors: (*Coherent radiation, Modulation), Modulators, Microwave frequency, Demodulation, Detection, Kerr cells, Multiplex, Colloids, Electrooptics, Photomultipliers.

Research on methods of modulating and demodulating light at microwave frequencies is briefly summarized with references to publications resulting from this research. Modulation research included studies of travelling-wave Kerr cells, multiplexing of modulation signals in resonant Kerr cells, and electro-optical effects in colloids. Detection studies centered on further study of the fast-response dynamic crossed-field photomultiplier. (Author)
AD-669 575 HC$3.00 MF$0.65

DEVELOPMENT OF INSTRUMENTATION WHICH WILL ALLOW MEASUREMENT OF THE INFRARED REFRACTIVE INDEX OF OZONE.
Block Engineering Inc Cambridge Mass
For primary bibliographic entry see Field 14B.
AD-669 576 HC$3.00 MF$0.65

STIMULATED BRILLOUIN SCATTERING.
Doctoral thesis,
Cornell Univ Ithaca N Y School of Electrical Engineering
Jules Walder. 19 Feb 68, 126p Rept no. Scientific-4
AFCRL-68-0112
Contract AF 19 (628)-5677

Descriptors: (*Coherent radiation, Scattering), (*Phonons, Emissivity), Acoustics, Diffraction, Gain, Electrostriction, Mechanical waves, Alkanes, Methanols, Carbon tetrachloride, Quartz, Gas lasers, Theses.
Identifiers: *Brillouin scattering, Stokes emission.

The characteristics of the Stokes light and the hypersound generated by the stimulated Brillouin scattering of ruby laser light in various liquids and fused quartz at room temperature are studied in detail experimentally. In the case of nonfocusing liquids such as n-hexane, methanol, and carbon tetrachloride, it is found that at room temperature the measured characteristics of the Stokes light agree well with calculated results obtained on the basis of the steady-state theory; all the constants needed in the calculation are available from completely independent measurements. A similar study is made of fused quartz at room temperature. The results on the Stokes intensity is also used to estimate the attenuation constant of the 24 GHz hypersound in fused quartz at room temperature; it is 280/cm. In addition, the hypersound is detected and the spatial distribution of its intensity is measured by means of Bragg-diffraction of a He-Ne laser beam. In addition, a brief review of the steady-state theory of the stimulated Brillouin process is also given. (Author)
AD-669 577 HC$3.00 MF$0.65

THEORY OF PHOTOELECTRIC DETECTION,
Brandeis Univ Waltham Mass Dept of Physics
Robert H. Lehmberg. Dec 67, 120p Rept no. Scientific-1
AFCRL-67-0688
Contract F19628-68-C-0062

Descriptors: (*Photoelectric effect, Detectors), Quantum statistics, Statistical functions, Perturbation theory, Counting methods, Correlation techniques, Fermions, Bosons, Coherent radiation.
Identifiers: Photodetectors, Quantum electronics.

The report treats the photodetection problem from the standpoint of quantum transport theory. Quantities such as the counting distribution are expressed in terms of n-electron correlation functions, which can be analyzed by perturbation methods. The correlation function formalism provides a natural framework for describing photoemission, and it appears to offer several advantages over the earlier theories. Its generality enables one to avoid many of the unnecessary restrictions present in these earlier theories. It can be applied to multiphoton ionization, or even to processes in which photons are emitted as well as absorbed (e.g., Raman effect).
AD-669 579 HC$3.00 MF$0.65

BROADBAND LASER DISPLAY SYSTEM.
Progress rept. no. 1, Jan-Dec 67,
Army Electronics Command Fort Monmouth N J
S. Leroy Everett, Jr. Jan 68, 80p Rept no. ECOM-2937

Descriptors: (*Display systems, Lasers), (*Lasers, *Electrooptics), (*Input-output devices, Display systems), Design, Digital systems, Crystals, Birefringence, Modulation, Polarization, Reflection, Deflection, Colors, Alignment, Logic circuits, Models (Simulations), Specifications.
Identifiers: Potassium dihydrophosphate.

This is the first progress report of a series describing the in-house design, fabrication, and evaluation of a Broadband Laser Beam Digital Deflector Display System. The model will be a flexible breadboard assembly which will be used to evaluate and demonstrate 'broadband' or multi-color, laser beam deflection and display techniques. The output of the deflector will be 1024 discrete output light beam positions in each of two dimensions totaling over one million discrete locations. The color and the discrete position of the output beam will be controlled by conventional digital logic circuits. A primary advantage of this multi-color display system is the precise position registration of the small diameter, less than 50 micron, output light beam. General system design guidelines based upon previous external contractual study are presented. Use and extrapolation of these guidelines to determine optical crystal specifications for use in the breadboard deflector are described. A preliminary mechanical model of a split-angle deflector and a two-stage total internal reflection deflector have been designed and fabricated during this reporting period. Laboratory test and evaluation of the electro-conductive substrates for the electro-optic switch assembly are presented. Test procedures, results, and evaluation of small aperature electro-optic modulators for color beam selection are included. (Author)
AD-669 607 HC$3.00 MF$0.65

FIBER OPTICS IN THE USSR,
Joint Publications Research Service, Washington, D. C.
V. B. Veinberg. 7 Feb 68, 10p
Trans. of Optiko-Mekhanicheskaya Promyshlennost (USSR) n11 p48-51 1967.

Descriptors: (*Fiber optics, USSR), Light transmission, Optics, Optical images, Light, Pipes, Light communication systems, Resolution, Optical equipment.

The article discusses achievements made in the field of fiber optics.
JPRS-44272 HC$3.00 MF$0.65

SELECTED BIBLIOGRAPHY AND ABSTRACTS OF HIGH-TEMPERATURE OPTICAL PROPERTIES AND THEIR MEASUREMENT.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
D. W. Gates. 8 Dec 67, 37p NASA-TM-X-53679

Descriptors: *Bibliographies, *High temperature, *Optical properties, Absorptivity, Abstracts, Black body radiation, Emissivity, Heat transfer, Spectrum analysis.

For abstract, see STAR 06 12.
N68-21895 HC$3.00 MF$0.65

RAY STATISTICS IN A RANDOM MEDIUM WITH STRATIFIED BACKGROUND. DIFFUSION OF RAYS IN RANDOM MEDIA.
Illinois Univ., Urbana. Electrical Engineering Research Lab.
C. H. Liu, and K. C. Yeh. Feb 68, 45p NASA-CR-94306, TR-33
Grant NSG-24, Contract NSF GA-1249

Descriptors: *Light beams, *Mathematical models, *Wave propagation, Diffusion, Diffusion coefficient, Fokker-planck equation, Probability density functions, Refractivity.

For abstract, see STAR 06 12.
N68-22225 HC$3.00 MF$0.65

THE CORROSION RESISTANCE OF CERTAIN METALLIC MATERIALS FOR ASTRONOMICAL MIRRORS.
Techtran Corp., Glen Burnie, Md.
For primary bibliographic entry see Field 11F.
For abstract, see STAR 06 12.
N68-22227 HC$3.00 MF$0.65

FORTRAN OPTICAL LENS DESIGN PROGRAM. VOLUME 1 - MATHEMATICAL SPECIFICATIONS.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
P. J. Firnett, and L. A. Wilson. 15 Aug 67, 152p NASA-CR-94323, TR-67-700-10-2, V. 1
Contracts NAS7-100, JPL-951495
Prep- Prepared for Jpl

Descriptors: *Fortran, *Lens design, *Mathematical models, *Optical filters, Geometry, Lenses, Mathematical logic.

For abstract, see STAR 06 12.
N68-22242 HC$3.00 MF$0.65

INVESTIGATION OF THE THERMAL STABILITY OF THE MICROSURFACE OF ASTRONOMICAL MIRRORS FABRICATED FROM A MG6 L ALLOY WITH CHROMIUM AND NICKEL COATINGS.
National Aeronautics and Space Administration, Washington, D. C.
For primary bibliographic entry see Field
For abstract, see STAR 06 12.
N68-22401 HC$3.00 MF$0.65

NONLINEAR EFFECTS IN OPTICAL DATA PROCESSING FINAL PROGRESS REPORT.
North Carolina State Coll., Raleigh.
J. P. Moffatt, and F. J. Tischer. 15 Mar 68, 85p NASA-CR-94405
Contract NGR-34-002-038

Descriptors: *Data processing, *Fortran, *Nonlinearity, *Optical properties, *Spectrophotography, Fourier series, Harmonics, Photographic recording, Sine waves.

For abstract, see STAR 06 12.
N68-22845 HC$3.00 MF$0.65

ANNULAR APERTURE DIFFRACTED ENERGY DISTRIBUTION FOR AN EXTENDED SOURCE.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
I. L. Goldberg, and A. W. Mc Culloch. Apr 68, 33p NASA-TM-X-63186, X-622-68-132

Descriptors: *Apertures, *Diffraction patterns, *Energy distribution, *Radiation sources, Annuli, Bessel functions, Numerical integration, Optics.

For abstract, see STAR 06 12.
N68-22916 HC$3.00 MF$0.65

FURTHER DEVELOPMENT OF ULTRAVIOLET DOSIMETRY BY PLASTICS.
Pennsylvania State Univ., University Park. Coll. of Earth and Mineral Sciences.
For primary bibliographic entry see Field 17E.
PB-177 734 HC$3.00 MF$0.65

20G. Particle Accelerators

COMPRESSION SYSTEM FOR ION-BURSTS IN THE VAN DE GRAAFF AT THE CADARACHE CENTER.
Systeme de Compression de Bouffees D Ions pour le Van de Graaff Du Cen/Cadarache
Commissariat A L Energie Atomique, Cadarache (France).
A. Arnaud, A. Calvet, J.-C. Carossi, E. Pomelas, and L. Rizzitelli. Dec 67, 31p CEA-R-3325
Lang- in French

Descriptors: *Ion beams, *Van de graaff accelerators, Magnetic fields, Particle acceleration, Pulse modulation, Spectrometers.

For abstract, see STAR 06 12.
N68-22721 HC$3.00

EVALUATION OF A REM RESPONDING NEUTRON DETECTOR FOR USE AROUND THE UNIVERSITY OF ROCHESTER'S 20 MEV EMPEROR TANDEM VAN DE GRAAFF ACCELERATOR,
Rochester Univ., N. Y. Atomic Energy Project.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 22 10.
UR-49-903 HC$3.00 MF$0.65

20H. Particle Physics

EVIDENCE FOR ELECTRON-TO-PHONON INTERACTION IN InSb.
Journal article,
Massachusetts Inst of Tech Lexington Lincoln Lab
Dana H. Dickey, and David M. Larsen. 9 Nov 67, 6p Rept no. JA-3139

ESD-TR-68-50
Contract AF 19 (628)-5167
Availability: Published in Physical Letters, v20 n2 p65-9 8 Jan 68.

Descriptors: (*Indium antimonides, *Electron transitions), Interactions, Protons, Electrons, Impurities, Anomalies, Magnetic fields, Absorption, Valence, Excitation, Measurement, Infrared spectrophotometers, Cyclotron resonance phenomena, Optical properties, Polarization, Ionization, Theory.

Anomalies in the spectrum of shallow donor impurities in a magnetic field in InSb are observed. Our data show complicated polaron anomalies which indicate that an electron-TO-phonon interaction exists in InSb and is of strength comparable with the electron-LO-phonon interaction in this material. Because strong Reststrahl absorption obscures observations in the region where polaron pinning occurs, the pinning phenomenon has, until the present, not been observed in intraband magnetoabsorption. Pinning has been reported only in interband experiments, where a detailed interpretation of the phenomenon is made difficult by complex exciton and valence band structure. The intraband experiment reported here lends itself to much more straightforward interpretation. (Author)
AD-669 206 Not available from CFSTI.

PERIPHERAL DIPION PRODUCTION BY PIONS OF 12 AND 18 GeV/c.
Revised ed.,
European Council for Nuclear Research Geneva (Switzerland)
Lawrence W. Jones, E. Bleuler, D. O. Caldwell, B. Elsner, and D. Harting. 23 Feb 67, 26p
Contract Nonr-1224 (23)
Revision of report dated 27 Jun 66.
Availability: Published in The Physical Review, v166 n2 p1405-30 Feb 25 1968.

Descriptors: (*Pions, *Pair production), Nucleons, Meson reactions, Elastic scattering, Nuclear spectroscopy, Mass spectrum, Meson cross sections, Nuclear resonance, Switzerland.
Identifiers: *Subnuclear spectroscopy, Pion production, Pion exchange, Resonance particles.

A spark-chamber experiment on the peripheral production of 9245 pion pairs by 12- and 18-GeV/c incident pions is reported and analyzed in terms of a one-pion-exchange model in which the final state at the nucleon vertex contains generally one or more pions. The relevant dynamics and kinematics appropriate to this problem are reviewed, and the experimental and analysis techniques giving good resolution and detection-bias correction are discussed in some detail. From the results, fair agreement is found between the data and the one-pion-exhange calculation of the neutral rho meson production cross sections and of the associated missing-mass spectra. The neutral rho meson is found to be consistent with a single peak, and no evidence of peak splitting is observed. A search for a narrow s-wave dipion resonance is made with negative results. Normalizing to the neutral rho meson, the s-wave positive-pion negative pion scattering cross section is computed from the abundant low-dipion-mass events, giving a cross section falling smoothly from 50 mb (300 MeV) to about 20 mb (600 MeV). No evidence of an s-wave resonance is found in this range of energies. Below 450 MeV, the pion-pion scattering asymmetry favors backward scattering (by 2 1/2 standard deviations), which is consistent with a negative and falling J=T=0 phase shift. The extrapolated forward-backward asymmetry and the s-wave cross section are both consistent with a J=T-0 phase shift near 90 degrees at about 750 MeV. (Author)
AD-669 293 Not available from CFSTI.

PROPERTIES OF GAS LASERS.
Final rept. 1 Apr 65-31 Mar 68,
Hawaii Univ Honolulu Dept of Physics and Astronomy
John R. Holmes. 31 Mar 68, 6p
AFOSR-68-0969
Grant AF-AFOSR-917-65

Descriptors: (*Gas lasers, Atomic energy levels), (*Atomic energy levels, Neon), Excitation, Interactions, Helium, Infrared radiation, Gas discharges, Perturbation theory, Infrared spectroscopy, Astrophysics, Atomic structure, Theses.

The development of gas lasers has provided the experimental atomic physicist with a new tool for the selective probing of atomic energy levels. This dissertation describes the development of a gas laser system for the measurement of atomic parameters. The system has been applied to the measurement of transition probabilities and collision excitation cross sections in neon. The experimental technique utilizes a helium-neon laser oscillating at 3.39 microns --3s2-3p4 (Paschen notation) -- to perturb the population density of the 3s2 level in a neon discharge. This perturbation is coupled to the 3s3 neon level through non-radiative collision induced transitions. (Author)
AD-669 389 HC$3.00 MF$0.65

A 50 s RIBOSOMAL DETERMINANT: IMMUNOLOGICAL STUDIES CORRELATING FUNCTION AND STRUCTURE.
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6P.
AD-669 390 Not available from CFSTI.

NOTE ON NONLINEAR REALIZATIONS OF CHIRAL SYMMETRY,
Rand Corp Santa Monica Calif
William Sollfrey. May 68, 4p Rept no. P-3843
Availability: To be published in Physical Review Letters.

Descriptors: (*Pions, *Field theory), Decay schemes, Tensor analysis, Differential equations, Operators (Mathematics), Nonlinear systems.
Identifiers: *Symmetry (Quantum mechanics).

The general solution is found for Weinberg's equation for the Lagrangian of chiral symmetry breaking. The result is an elementary function, and in the particular care of a tensor of rank 2 the effect of the nonlinearity is to multiply the ordinary Lagrangian by a simple factor. (Author)
AD-669 413 Not available from CFSTI.

ON THE FOLDY-WOUTHUYSEN TRANSFORMATION FOR PARTICLES IN AN ELECTROMAGNETIC FIELD,
Barcelona Univ (Spain) Instituto de Fisica Teorica
L. M. Garrido, and L. Oliver. 21 Nov 67, 20p
AFOSR-68-0989
Grant AF-EOAR-17-64
Availability: Published in Il Nuovo Cimento Serie X, v52A p588-605 Nov 21 1967.

Descriptors: (*Elementary particles, Transformations (Mathematics)), Hamiltonian, Wave functions, Electromagnetic fields, Operators (Mathematics), Nuclear spins, Spain.

An extent is presented of the Foldy-Wouthuysen transformation to particles of arbitrary spin interacting with an electromagnetic field. Equations are derived for particles of spin 1/2,0 and 1 interacting with the electromagnetic field in the nonrelativistic limit; also the operators associated to the dynamical variables mean position and mean velocity were calculated in the new and old representations; interpreting physically the terms of the obtained Hamiltonian. In particular, the formulation solves a remaining problem in obtaining a Darwin term analogous for spin 1/2,0 and 1. This formulation is based on the F01dy-Wouthuysen transformation for spin 1/2 particles in an electromagnetic field, and on a generalizatiòn for arbitrary spin of the Foldy-Wouthuysen transformation previously presented. (Author)
AD-669 471 Not available from CFSTI.

ANOMALOUS AND NORMAL SINGULARITIES AND THE INFINITE-MOMENTUM LIMIT,
Yeshiva Univ New York Belfer Graduate School of Science
Leonard Susskind, and Graham Frye. 22 Mar 68, 3p
AFOSR-68-0987
Grant AF-AFOSR-1282-67
Availability: Published in The Physical Review, v165 n5 p1553-4 Jan 25 1968.

Descriptors: (*Charged particles, Interactions), Relativity theory, Quantum mechanics, Relativity theory, Wave functions, Momentum, Potential theory.
Identifiers: *Bound particles, Mass, Form factors.

The behavior of the intrinsic size of a bound state as a function of its mass is derived by using an analogy between nonrelativistic two-dimensional quantum mechanics and the infinite-momentum limit of relativistic quantum theory. (Author)
AD-669 472 Not available from CFSTI.

POSITIVE-TAU ANALYSIS.
Technical rept.,
Stevens Inst of Tech Hoboken N J Dept of Physics
J. Grauman, E. L. Koller, S. Taylor, D. Pandoulas, and S. Hoffmaster. Apr 68, 15p Rept no. SIT-P216
Contract Nonr-3066 (00)
Pub. in American Physical Society. Bulletin (U. S.) v13 p586 1968.

Descriptors: (*Mesons, *Decay schemes), Pions, Meson reactions, Particle trajectories, K-mesons, Nuclear spectroscopy.
Identifiers: *Tau mesons, Subnuclear spectroscopy.

An analysis is presented of approximately 6500 'positive-tau to 2 positive pions + negative-pion' decays at rest. These events were found in a systematic frame-by-frame scan of 70-mm. bubble chamber film taken from the 30-in. Columbia-Brookhaven National Laboratory propane bubble chamber exposed to a separated positive-K meson beam. The energy spectra of the pions are compared to existing experimental data and to the spectra predicted by various theoretical models for t-decay. (Author)
AD-669 491 HC$3.00 MF$0.65

FREE-INDUCTION DECAY IN A MAGNETICALLY DILUTE SOLID,
Case-Western Reserve Univ Cleveland Ohio
T. M. Wu. 1967, 4p
AFOSR-68-0985
Grant AF-AFOSR-565-66
Availability: Published in Solid State Communications, v5 p935-7 1967.

Descriptors: (*Nuclear spins, Interactions), (*Nuclear magnetic resonance, Solids), Integral transforms, Hamiltonian, Magnetic fields, Calcium fluorides, Crystal lattices.

The free-induction decay of a magnetically dilute system with spin 1/2 is evaluated using the Abragam Ansatz, Lowe-Norberg method and Evans-Powles method separately. One finds that the results obtained by Lowe-Norberg theory disagree with those of Abragam Ansatz or Even-Powles theory. This disagreement is believed to be due to an inadequate expansion for F (t). (Author)
AD-669 533 Not available from CFSTI.

POLARIZATION OF LYMAN-ALPHA RADIATION FROM H (+)- AND D (+)-RARE-GAS CHARGE-TRANSFER COLLISIONS,
Washington Univ Seattle Dept of Physics
For primary bibliographic entry see Field 7D.
AD-669 535 Not available from CFSTI.

ATOMIC MASSES OF Fe56 AND Fe57,
Minnesota Univ Minneapolis School of Physics and Astronomy
For primary bibliographic entry see Field 7D.
AD-669 545 Not available from CFSTI.

1 BEV ELECTRON COMPTON SCATTERING NEAR 180 DEGREES,
Stanford Univ Calif High Energy Physics Lab
B. Gittelman, W. C. Barber, W. Selove, D. Tompkins, and F. Forman. Mar 68, 18p Rept no. HEPL-558
Prepared in cooperation with Stanford Linear Accelerator Center, report no. SLAC-Pub-403 and Pennsylvania Univ., Philadelphia.
Availability: To be published in the Physical Review.

Descriptors: (*Compton scattering, Distribution), Electrons, Positrons, Pair production, Bremsstrahlung, Nuclear spectroscopy.

Electrons and positrons near 0 degrees Lab were measured using bremsstrahlung photon spectra of 950 and 500 Mev maximum energy. The results are interpreted in terms of pair production and electron Compton scattering, the latter contributing primarily for center-of-mass scattering angles near 180 degrees. The results are in agreement with the Klein-Nishina formula to within the accuracy of this experiment, which is about 10%. (Author)
AD-669 547 Not available from CFSTI.

MATRIX PRODUCTS AND THE EXPLICIT 3, 6, 9, AND 12-j COEFFICIENTS OF THE REGULAR REPRESENTATION OF SU (n),
Maryland Univ College Park Dept of Physics and Astronomy
L. M. Kaplan, and M. Resnikoff. 4 Aug 66, 14p AFOSR-68-1006
Grant AF-AFOSR-500-66
Availability: Published in Journal of Mathematical Physics, v8 n11 p2194-2205 Nov 1967.

Descriptors: (*Elementary particles, Groups (Mathematics)), Nuclear scattering, Leptons, Baryons, Decay schemes, Matrix algebra.
Identifiers: Symmetry (Quantum mechanics), Wigner coefficients.

The explicit Wigner coefficients are determined for the direct product of regular representations, the product of (N) and (N) = 2 (N) + ..., of SU (n), where N = n sq. - 1. Triple products CmCiCm = alpha (Fi) + beta (Di), and higher-order products, are calculated, where Ci may be Fi or Di, the N x N Hermitian matrices of the regular representation, and m is summed. The coefficients alpha, beta are shown to be 6-j symbols, and higher-order products yield the explicit 9-j, 12-j, symbols. A theorem concerning (3p)-j coefficients is proved. (Author)
AD-669 550 Not available from CFSTI.

MOSSBAUER EFFECT AND LIFETIME OF THE 46.5 KEV LEVEL OF 183 W,
Technische Hochschule Vienna (Austria) Institut Fuer Experimentalphysik (Ii)
Manfred Drosg, and Endre Ujlaki. 20 Jan 68, 4p AFOSR-68-0995
Contract AF 61 (052)-845
Availability: Published in Acta Physica Austriaca, v25 n4 p334-5 1967.

Descriptors: (*Tantalum, *Nuclear energy levels), (*Tungsten, *Mossbauer effect), Decay schemes, Isomeric transitions, Nuclear radiation spectrometers, Austria.

The Mossbauer factor for Ta is determined (f (295K) = 0.13) using a crystal spectrometer for background elimination. The half-life of the level is found to be 0.19 plus or minus 0.02 ns. (Author)
AD-669 551 Not available from CFSTI.

STATISTICAL EQUILIBRIUM MODEL ATMOSPHERES FOR EARLY-TYPE STARS. III. HYDROGEN AND HELIUM CONTINUA,
Princeton Univ N J Observatory
For primary bibliographic entry see Field 3B.
AD-669 677 Not available from CFSTI.

BULK SHIELD FACILITY IRRADIATION ACCOMMODATIONS AT THE AIR FORCE NUCLEAR ENGINEERING TEST FACILITY.
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
For primary bibliographic entry see Field 18M.
AD-669 685 HC$3.00 MF$0.65

MOESSBAUER-EFFECT DATA-COLLECTION SYSTEM,
Argonne National Lab., Ill.
R. H. Vonderohe, and R. A. Aschenbrenner. Nov 67, 18p
Contract W-31-109-eng-38

Descriptors: (*Mossbauer effect, *Data processing systems), Digital computers.

For abstract, see NSA 22 10.
ANL-7386 HC$3.00 MF$0.65

REVIEWS OF THE RELATIVISTIC ASPECTS OF THE THREE-BODY PROBLEM - PRACTICAL COMPUTATIONS FORM FACTORS IN S-MATRIX THEORY.
Laboratoire de Physique Theorique Et des Hautes Energies, Orsay (France).
J. L. Basdevant, and R. Omnes. Mar 68, 35p REPT.-68/10
Conf- Presented At the Intern. Conf., Houston, Tex., Apr. 1968

Descriptors: *Form factors, *Mandelstam representation, *Three body problem, Linear equations, Mathematical models, S matrix theory, Scattering amplitude.

For abstract, see STAR 06 12.
N68-21849 HC$3.00

MASS RELATIONS FOR 1 MINUS AND 1 PLUS NONETS BASED ON WEINBERGS SUM RULES.
Kyoto Univ. (Japan). Research Inst. for Fundamental Physics.
K. Kawarabayashi, and S. Kitakado. Jan 68, 10p RIFP-67

Descriptors: *Asymptotes, *Symmetry, *Vector mesons, Baryons, Derivation, Group theory, Integral equations, Mass ratios, Mathematical models, Vector currents.

For abstract, see STAR 06 12.
N68-21990 HC$3.00 MF$0.65

SHADOW ELASTIC SCATTERING IN THE MULTI- REGGE- EXCHANGE MODEL.
Cieniowe Rozpraszanie Elastyczne W Modelu Wielokrotnej Wymiany Biegunow Regge
Polish Academy of Sciences, Warsaw. Institute of Nuclear Physics.
A. Bialas, L. Michejda, and J. Turnau. 1968, 12p REPT.-88016/PH

Descriptors: *Elastic scattering, *Mathematical models, *Momentum transfer, *Particle production, *Regge poles, Elementary particles, Estimating, Scattering cross sections, Theoretical physics.

For abstract, see STAR 06 12.
N68-22020 HC$3.00

LAMBDA-NUCLEON SCATTERING.
Polish Academy of Sciences, Warsaw. Inst. of Nuclear Research.
A. Deloff. 1967, 29p REPT.-848/7/PL
Subm- Submitted for Publication

Descriptors: *Baryons, *Boson fields, *Charged particles, *Mathematical models, *Meson-nucleon interactions, Elementary particles, Group theory, Nuclear spin, Theoretical physics.

For abstract, see STAR 06 12.
N68-22112 HC$3.00

NEW SOLUTIONS OF THE THIRRING MODEL.
International Centre for Theoretical Physics, Trieste (Italy).
C. R. Hagen. Apr 67, 21p IC-67-23
Agency Date- Apr. 1967 Coll- 21 P Refs Subm-Submitted for Publication

Descriptors: *Green function, *Mathematical models, *Operators (mathematics), *Vector mesons, Canonical forms, Equations of motion, Fermions, Field theory (physics), Quantum theory, Vector currents, Vector spaces.

For abstract, see STAR 06 12.
N68-22158 HC$3.00 MF$0.65

PARTIALLY CONSERVED TENSOR CURRENT HYPOTHESIS AND THE PHOTOPION AMPLITUDE.
International Centre for Theoretical Physics, Trieste (Italy).
W. W. Wada. Mar 67, 23p IC-67-17
Contract AT/11-1/-1545
Agency Date- Mar. 1967 Coll- 23 P Refs Subm-Submitted for Publication Spon- Sponsored in Part By U.S. Aec Prep- Prepared for U.S. Aec

Descriptors: *Amplitudes, *Photoelectric emission, *Pions, *Tensors, *Vector currents, Electric charge, Electric dipoles, Magnetic moments, Photons, Sums.

For abstract, see STAR 06 12.
N68-22191 HC$3.00 MF$0.65

ON THE COVARIANCE OF EQUAL TIME COMMUTATORS AND SUM RULES.
International Centre for Theoretical Physics, Trieste (Italy).
C. G. Bollini, J. J. Giahbiagi, and J. Tiomno. Apr 67, 15p IC-67-25
Agency Date- Apr. 1967 Coll- 15 P Refs Subm-Submitted for Publication

Descriptors: *Commutators, *Covariance, *Sums, *Time dependence, Canonical forms, Invariance, Operators (mathematics), Tensors, Vector currents, Vector spaces.

For abstract, see STAR 06 12.
N68-22193 HC$3.00 MF$0.65

MATRIX ELEMENTS OF NON-CENTRAL TWO-BODY NUCLEAR FORCES.
International Centre for Theoretical Physics, Trieste (Italy).
G. Gmitro. Apr 67, 13p IC-67-26
Agency Date- Apr. 1967 Coll- 13 P Refs Subm-Submitted for Publication

Descriptors: *Matrix methods, *Nuclear binding energy, *Spin-orbit interactions, *Spin-spin coupling, Approximation, Calcium isotopes, Field theory (physics), Nuclear particles, Tensors, Theoretical physics, Two body problem, Wave functions.

For abstract, see STAR 06 12.
N68-22196 HC$3.00 MF$0.65

THE WOODS- SAXON WAVE FUNCTIONS AND THE BETA TRANSITIONS OF DEFORMED NUCLEI.
International Centre for Theoretical Physics, Trieste (Italy).
D. Bogdan. Apr 67, 29p IC-67-20

Agency Date- Apr. 1967 Coll- 29 P Refs Subm Submitted for Publication

Descriptors: *Electron transitions, *Forbidden transitions, *Thulium isotopes, *Wave functions, Electron decay rate, Matrix methods, Nuclear deformation, Nuclei (nuclear physics), Theoretical physics.

For abstract, see STAR 06 12.
N68-22197 HC$3.00 MF$0.65

BARYON MASS SPLITTINGS IN AN SU/6/ TIMES O/3/ QUARK MODEL.
International Centre for Theoretical Physics, Trieste (Italy).
V. S. Bhasin, D. L. Katyal, and A. N. Mitra. May 67, 30p IC-67-27
Agency Date- May 1967 Coll- 30 P Refs Subm-Submitted for Publication

Descriptors: *Baryons, *Mass transfer, *Mathematical models, *Particle spin, *Quarks, Group theory, Matrix methods, Particle mass, Spin resonance, Splitting, Theoretical physics.

For abstract, see STAR 06 12.
N68-22198 HC$3.00 MF$0.65

A NOTE ON THE LAMBDA-LAMBDA-HYPERNUCLEUS LAMBDA-LAMBDA C 14.
International Centre for Theoretical Physics, Trieste (Italy).
S. Ali, M. E. Grypeos, and L. P. Kok. May 67, 11p IC-67-29
Agency Date- May 1967 Coll- 11 P Refs Subm-Submitted for Publication

Descriptors: *Baryons, *Carbon 14, *Hypernuclei, *Potential energy, Charged particles, Dynamic models, Elementary particles, Hyperons, Nuclear energy, Nuclear physics, Theoretical physics, Three body problem.

For abstract, see STAR 06 12.
N68-22199 HC$3.00 MF$0.65

REDUCTION OF THE TWO-ELECTRON BREIT EQUATION.
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
P. G. Estabrooks. 2 Nov 67, 17p NASA-CR-94350, WIS-TCI-264
Grant NSG-275-62

Descriptors: *Electron energy, *Partitions (mathematics), *Wave functions, Approximation, Hamiltonian functions, Matrices (mathematics), Perturbation theory, Transformations (mathematics).

For abstract, see STAR 06 12.
N68-22214 HC$3.00 MF$0.65

QUARK MODEL COUPLINGS AND STRONG DECAYS OF TENSOR AND AXIAL MESONS.
International Centre for Theoretical Physics, Trieste (Italy).
A. N. Mitra, and P. P. Srivastava. May 67, 8p IC-67-31
Agency Date- May 1967 Coll- 8 P Refs Subm-Submitted for Publication

Descriptors: *Coupling coefficients, *Mathematical models, *Mesons, *Radioactive decay, Centrifugal force, Elementary particle interactions, Form factors, Kaons, Nuclear spin, Pions, S waves, Vector currents, Wave functions.

For abstract, see STAR 06 12.
N68-22219 HC$3.00 MF$0.65

FERMION TRAJECTORY PARAMETRIZATION AND SUPERCONVERGENCE.
International Centre for Theoretical Physics, Trieste (Italy).
R. Ramachandran. May 67, 15p IC-67-30
Agency Date- May 1967 Coll- 15 P Refs Subm-Submitted for Publication Prep- Jointly Prepared With California Univ., Riverside

Descriptors: *Convergence, *Fermions, *Parameterization, *Particle trajectories, *Resonance scattering, Amplitudes, Asymptotes, Mesons, Parity, Regge poles, S waves, Sums, Symmetry.

For abstract, see STAR 06 12.
N68-22221 HC$3.00 MF$0.65

CURRENT DEFINITION AND MASS RENORMALIZATION IN A MODEL FIELD THEORY.
International Centre for Theoretical Physics, Trieste (Italy).
For primary bibliographic entry see Field 20J.
For abstract, see STAR 06 12.
N68-22282 HC$3.00 MF$0.65

PHENONENOLOGICAL ALPHA-ALPHA POTENTIAL AND THE GROUND STATE OF BE8.
International Centre for Theoretical Physics, Trieste (Italy).
S. A. Afzal, and S. Ali. Apr 67, 8p IC-67-22
Agency Date- Apr. 1967 Coll- 8 P Refs Subm-Submitted for Publication

Descriptors: *Alpha particles, *Beryllium isotopes, *Ground state, Energy levels, Least squares method, Nucleon potential, Phase shift, Resonance scattering, S waves.

For abstract, see STAR 06 12.
N68-22337 HC$3.00 MF$0.65

EXCITATION AND IONIZATION OF POSITIVE HELIUM ION (1S) BY ELECTRON IMPACT.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
H. L. Kyle, and K. Omidvar. May 68, 10p
NASA-TM-X-63182, X-641-68-151

Descriptors: *Electron impact, *Excitation, *Helium ions, *Ionization, Atomic collisions, Atomic energy levels, Born approximation, Electron energy.

For abstract, see STAR 06 12.
N68-22388 HC$3.00 MF$0.65

NEUTRON SPECTROMETRY FROM 0.025 E V TO 25 GE V.
Gt. Brit. National Inst. for Research in Nuclear Science, Chilton. Rutherford High Energy Lab.
G. R. Stevenson. Nov 67, 41p RHEL/R-154

Descriptors: *Iterative solution, *Neutron activation analysis, *Neutron spectra, Neutron physics, Neutron spectrometers.

For abstract, see STAR 06 12.
N68-22449 HC$3.00 MF$0.65

INVESTIGATION OF (E SUP PLUS E SUP MINUS) PAIR PRODUCTION BY ELECTRONS WITH ENERGY OF 2.4 GE V.
Issledovanie Obrazovaniya (E Sup Plus E Sup Minus)-par Elektronami S Energiei 2.4 Gev
Stanford Univ., Calif. Linear Accelerator Center.
V. G. Grishin, M. M. Muminov, V. D. Ryabtsov, and Yabem . 1967, 26p SLAC-TRANS-64, JINR-P1-3143
Tran- Transl. Into English From Rept. No Jinr-p1-3143

Descriptors: *Bubble chambers, *Electron beams, *Ionization cross sections, *Pair production, *Propane, Elementary particles, Ionizing radiation, Nuclear physics.

For abstract, see STAR 06 12.
N68-22672 HC$3.00 MF$0.65

MEASUREMENT OF PI PLUS OVER MINUS P FORWARD ELASTIC DIFFERENTIAL CROSS-SECTIONS AT 410 AND 490 ME V.
Mesures des Sections Efficaces Differentielles Pi Plus Over Minus P A 410 Me V Et 490 Me V Vers L Avant
Commissariat A L Energie Atomique, Saclay (France).
M. Banner. 1967, 55p CEA-R-3146
Lang- in French

Descriptors: *Elastic scattering, *Pions, *Proton scattering, *Scattering cross sections, Forward scattering, Incident radiation, Spark chambers.

For abstract, see STAR 06 12.
N68-22764 HC$3.00 MF$0.65

ELECTRONIC DEVICE FOR MEASURING THE POLARIZATION PARAMETER IN THE PI MINUS P YIELDS PI DEG N CHARGE EXCHANGE REACTION ON A POLARIZED PROTON TARGET.
Un Appareillage Electronique Destine A La Mesure Du Parametre de Polarisation Dans La Reaction D'echange de Charge Piminus P Yields Pi Deg N Sur Cible de Protons Polarises
Commissariat A L Energie Atomique, Saclay (France).
S. Brehin. Dec 67, 75p CEA-R-3357
Lang- in French, English Summary

Descriptors: *Charge exchange, *Charged particles, *Polarization (charge separation), *Radiation counters, Antiparticles, Gamma rays, Neutron scattering, Pions, Proton scattering, Radioactive decay, Spark chambers.

For abstract, see STAR 06 12.
N68-22877 HC$3.00 MF$0.65

EQUILIBRIUM SPECTRA OF SECONDARY COSMIC-RAY POSITRONS IN THE GALAXY AND THE SPECTRUM OF COSMIC-GAMMA-RAYS RESULTING FROM THEIR ANNIHILATION.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
For primary bibliographic entry see Field 3B.
For abstract, see STAR 06 12.
N68-22925 HC$3.00 MF$0.65

CONTRIBUTION TO THE EXPERIMENTAL STUDY OF THE CRITICAL SCATTERING OF COLD NEUTRONS IN IRON.
Contribution A L Etude Experimentale de La Diffusion Critique des Neutrons Froids Par le Fer
Commissariat A L Energie Atomique, Saclay (France).
K. Jovan. Jan 68, 72p CEA-R-3317
Lang- in French

Descriptors: *Cold neutrons, *Curie temperature, *Iron, *Magnetic flux, *Neutron scattering, Magnetic fields, Phase transformations, Scattering cross sections.

For abstract, see STAR 06 12.
N68-23001 HC$3.00 MF$0.65

NEUTRON ACTIVATION TECHNIQUES FOR MINERAL EXPLORATION.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see NSA 22 10.
TID-23668 HC$3.00 MF$0.65

SORS CONTE CARLO PHOTON-TRANSPORT CODE FOR THE CDC 6600,
California Univ., Livermore. Lawrence Radiation Lab.

John Kimlinger, Ernest F. Plechaty, and John R. Terrall. 4 Dec 67, 44p
Contract W-7405-eng-48

Descriptors: (*Photons, Transport properties), Computer programs, Monte Carlo method.

For abstract, see NSA 22 10.
UCRL-50358 HC$3.00 MF$0.65

THE CALCULATION OF LOW-ENERGY (n,p) REACTIONS,
California Univ., Livermore. Lawrence Radiation Lab.
H. F. Lutz, and J. D. Anderson. 6 Dec 67, 13p
Contract W-7405-eng-48

Descriptors: (*Neutron reactions, Numerical analysis), (*Proton reactions, Numerical analysis), Statistical mechanics, Nuclear cross selections, Nuclear isomers.

For abstract, see NSA 22 10.
UCRL-50359 HC$3.00 MF$0.65

REPORTS TO THE AEC NUCLEAR CROSS SECTIONS ADVISORY COMMITTEE, IDAHO FALLS, IDAHO, OCTOBER 17-18, 1967,
Idaho Nuclear Corp., Idaho Falls.
M. S. Moore. 18 Oct 67, 209p*

Descriptors: (*Nuclear cross sections, Symposia), Neutron cross sections, Nuclear models, Nuclear structure, Gamma emission, Proton cross sections, Alpha cross sections.

For abstract, see NSA 22 10.
WASH-1079 HC$3.00 MF$0.65

20I. Plasma Physics

QUARTERLY PROGRESS REPORT NO. 89,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
For primary bibliographic entry see Field 5B.
AD-669 231 HC$3.00 MF$0.65

A NEW PREDICTOR-CORRECTOR METHOD FOR QUASILINEAR FIRST-ORDER PARTIAL DIFFERENTIAL EQUATIONS,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 12A.
AD-669 336 HC$3.00 MF$0.65

AN ANALYTICAL STUDY OF A FLUID CYLINDER ARC MODEL BALANCED BY CROSSED MAGNETIC AND FLOW FIELDS.
Final rept. 1 Nov 66-31 Oct 67,
Ohio State Univ Columbus Dept of Mechanical Engineering
D. H. Kihara, and L. S. Han. Jan 68, 105p
ARL-68-0019
Contract F33615-67-C-1176

Descriptors: (*Electric arcs, *Magnetohydrodynamics), Magnetic fields, Flow fields, Fluids, Plasma medium, Heat transfer, Models (Simulations), Permeability, Cylindrical bodies, Interactions, Jet mixing flow, Momentum, Thermal conductivity, Nitrogen.
Identifiers: Cross flow.

A free-burning electric arc subjected to a cross-flow and a cross magnetic field is represented by an impermeable fluid cylinder model. This model allows for both momentum and energy exchange processes by viscous forces and conductive heat transfer around the cylindrical surface. Convective effects through the surface are assumed not to occur. The fluid dynamic and heat transfer characteristics within and outside the fluid cylinder model are investigated by proper matching of both flow and temperature fields at the cylinder boundary. The study shows that the arc radius and centerline temperature can be calculated provided the magnitudes of the applied external fields are known. The external fields are the electric field, the magnetic field and the cross flow field. The relationship among these parameters for a nitrogen arc is shown graphically. (Author)
AD-669 354 HC$3.00 MF$0.65

ANOMALOUS SKIN EFFECT IN A GASEOUS PLASMA,
Boeing Scientific Research Labs Seattle Wash Plasma Physics Lab
Melvin J. Kofoid. Jan 68, 17p Rept no. D1-82-0705

Descriptors: (*Electromagnetic fields, Penetration), Plasma medium, Anomalies, Stability, Electrons, Pressure.
Identifiers: *Skin effect.

Experimental data are presented for the skin effect in a plasma in which the electron thermal motions are sufficient to increase the field penetration. The results are consistent with the Weibel criteria for the existence of anomalous penetration and with the theoretical anomalous penetration depth. (Author)
AD-669 408 HC$3.00 MF$0.65

PENETRATION OF A HIGH-FREQUENCY FIELD IN A LOW-PRESSURE PLASMA,
Boeing Scientific Research Labs Seattle Wash Plasma Physics Lab
M. J. Kofoid, and H. V. Cleva. Jan 68, 46p Rept no. D1-82-0706

Descriptors: (*Plasma medium, Electromagnetic properties), (*Electromagnetic fields, Penetration), Pressure, Electron density, High frequency, Electrical conductance, Propagation.
Identifiers: Skin effect.

Comparisons between calculated and directly measured values of radial penetration of axially-directed magnetic fields in cylindrical plasmas were effected. Using small-amplitude elementary theory the curve of field intensity vs radius was calculated which matched the measured intensity at the axis. The plasmas were intense engough to display considerable skin effect. (Author)
AD-669 470 HC$3.00 MF$0.65

PERSISTENCE OF MHD-STABILITY IN THE TWO-FLUID MODEL,
California Univ Berkeley Dept of Physics
Pieter P. J. M. Schram, and H. Tasso. 15 Feb 68, 10p
AFOSR-68-0978
Grants AF-AFOSR-130-66, NSF-GP-4454
Prepared in cooperation with Association Euratom-Institut Fuer Plasmaphysik, Garching bei Muechen (West Germany).
Availability: Published in Nuclear Fusion, v7 p91-8 1967.

Descriptors: (*Magnetohydrodynamics, Stability), Hall effect, Magnetic pinch, Mathematical models, Fluids, Cyclotron resonance phenomena, Walls, Vacuum, Plasma medium.

A general proof is given that all static equilibria without volume currents which are stable according to magnetohydrodynamics (MHD) remain stable in the two-fluid model, if resistivity and electron inertia are neglected. Therefore the Hall term in Ohm's law can only have a stabilizing effect, if any effect at all. This result is valid for finite beta and arbitrary geometry, whether a wall or vacuum surrounds the plasma. As a special example the cylindrical pinch with surface currents is investigated in detail. (Author)
AD-669 544 Not available from CFSTI.

OPTIMIZATION OF AN X-BAND INTERFEROMETER FOR PLASMA DIAGNOSTICS.
Research note,
University Coll Cork (Ireland) Dept of Electrical Engineering
John C. Cronin, and Michael C. Sexton. 29 Jan 68, 7p
AFOSR-68-1004
Grant AF-EOAR-32-67
Availability: Published in International Journal of Electronics, v22 n6 p581-5 1967.

Descriptors: (*Afterglows, Electron density), (*Interferometers, X band), Optimization, Relaxation time, Probes (Electromagnetic), Sensitivity, Amplitude modulation, Eire.
Identifiers: *Plasma diagnostics.

A 9 GHZ (3 cm) microwave free-space interferometer for measuring electron density decay over the range 2 x 10 to the 11th power - 10 to the 10th power/cc in a pulsed discharge afterglow is described. By using initial 90 deg unbalancing (instead of the conventional 180 deg balance) considerable improvement in sensitivity was obtained. In addition, amplitude modulation of the microwave probing signal enabled instantaneous power fluctuations to be recorded accurately as a function of time during the afterglow. Significant errors are shown to arise if the effects of finite plasma boundaries are ignored. (Author)
AD-669 552 Not available from CFSTI.

SHOCK WAVE STRUCTURE IN GAS MIXTURES AND PLASMAS.
Interim rept.,
Toronto Univ (Ontario) Inst for Aerospace Studies
S. R. M. Sinclair. May 68, 106p Rept no. UTIAS-130
AFOSR-68-0576
Grant AF-AFOSR-276-66

Descriptors: (*Shock waves, *Plasma medium), Helium, Argon, Gas ionization, Diffusion, Monte Carlo method, Kinetic theory, Particle trajectories, Equations of motion, Canada.

The research was concerned with a theoretical description of shock wave structure in gaseous mixtures when diffusive effects are important. The problem considered in detail is the structure of a shock wave in a helium-argon mixture in which the argon is present in very small concentration. An anomalous result, cited in the literature, suggesting that the argon undergoes an initial pre-expansion before compression, was analysed to show the theoretical origin of this effect. The velocity distribution of a trace of heavy gas (and its lower moments) are watched as the heavy particles pass through a Mott-Smith background shock of lighter particles. The Mott-Smith background is chosen because its bimodal Maxwellian form provides an analytical determination of the free path to the next event for the heavy test particle at any point along its trajectory. This so-called Monte Carlo solution to the idealized diffusion shock problem can be used as a standard for evaluating the diffusion equations derived from various kinetic theory approximations. A number of systems of moment equations of the heavy particle Boltzmann equation were solved and the resulting heavy particle moment profiles compared with those of the Monte Carlo solution. A second strong diffusion problem was analysed from a kinetic theory point of view. It was found experimentally that the ion density profile through a shock in a weakly ionized plasma with elevated electron temperature is much more diffuse than the neutral atom shock. The theoretical analysis shows that this strong diffusion effect can be attributed to the electrical coupling between the ions and the hotter electron gas. (Author)
AD-669 570 HC$3.00 MF$0.65

PLASMA FRONT STUDIES.
Final rept. 1 Mar 66-29 Feb 68,
Vanderbilt Univ Nashville Tenn Dept of Physics
John Paul Barach. 8 Mar 68, 8p
AFOSR-68-1034
Grant AF-AFOSR-287-66

Group 20I — Plasma physics

Descriptors: (*Plasma physics, Scientific research), Plasma medium, Magnetohydrodynamics, Shock tubes, Interactions, Spectroscopy, Magnetic fields, Electrical properties, Ejection.

A summary is given of work done in 1966-1967 on behavior of electric shock tube plasmas. Mention is made of magnetic interaction experiments (flux transport and induction generator), arc spectroscopy, and shock flow experiments at both high and low density. Throughout, the importance of ejected driver material is emphasized; the flow is basically blast wave in character. (Author)
AD-669 572 HC$3.00 MF$0.65

COLLISIONAL DAMPING OF A PLASMA ECHO,
Princeton Univ N J Plasma Physics Lab
C. H. Su, and C. Oberman. 1968, 6p
AFOSR-68-1062
Contract AF 49 (638)-1555
Prepared in cooperation with Brown Univ., Providence, R. I. Div. of Applied Mathematics.
Availability: Published in Physical Review Letters, v20 n9 p427-9 Feb 26 1968.

Descriptors: (*Plasma oscillations, Damping), Interactions, Frequency, Diffusion, Turbulence.
Identifiers: *Plasma echoes.

It is shown that the collisional damping on the free streaming motion of plasma can be very important in certain circumstances even though the collisional frequency is small compared with the plasma frequency. Both spatial and temporal echoes are treated. In the latter case, for example, it was found that the collisional damping goes as exp (-beta (omega sub p) squared t cubed) (where beta is the collisional frequency). (Author)
AD-669 651 Not available from CFSTI.

METHOD FOR SOLVING THE KORTEWEG-deVRIES EQUATION,
Princeton Univ N J Plasma Physics Lab
For primary bibliographic entry see Field 12A.
AD-669 667 Not available from CFSTI.

HIGHER ORDER APPROXIMATIONS IN THE THEORY OF LONGITUDINAL PLASMA OSCILLATIONS,
Cornell Univ Ithaca N Y Center for Radiophysics and Space Research
F. Eniaudi, and W. I. Axford. May 68, 16p
AFOSR-68-1065
Contract AF 49 (638)-1527
Prepared in cooperation with Cornell-Sydney Univ. Astronomy Center, Ithaca, N. Y.
Availability: Published in J. Plasma Physics, v1 pt4 p483-97 1967.

Descriptors: (*Plasma oscillations, Nonlinear systems), One-dimensional flow, Electrostatics, Approximation (Mathematics), Perturbation theory, Equations of motion, Damping, Interactions.
Identifiers: Landau damping.

The non-linear behaviour of one-dimensional electrostatic oscillations in a homogeneous, unbounded, collisionless and fully ionized plasma is considered for the case in which a single wave of small, but finite amplitude is excited initially. The Vlasov-Poisson equations are solved using the method of strained coordinates in which the independent variable t, the electric field and the distribution function are expanded in the form of asymptotic series. An ordering parameter epsilon is introduced, which is proportional to the initial amplitude of the electric field given by linear theory. Differential equations are derived which can be solved sequentially to obtain uniformly valid solutions to all orders in epsilon. Solutions are given to second order and applied to the case in which the background distribution function is Maxwellian. It is found that the changes in the real and imaginary part of the frequency are small in comparison to the values obtained in the linear theory; that the free-streaming terms decay exponentially in time with a damping rate proportional to epsilon squared, in contrast with the linear theory where they are undamped; and that the analysis allows us to calculate the changes in the background distribution function for large time, resulting from particle-wave interactions. (Author)
AD-669 682 Not available from CFSTI.

THE EFFECTS OF CLEANING A LANGMUIR PROBE.
Royal Aircraft Establishment, Farnborough (England).
For primary bibliographic entry see Field 14B.
For abstract, see STAR 06 12.
N68-21986 HC$3.00 MF$0.65

SPECTROSCOPIC STUDY OF RECOMBINATION IN THE EARLY AFTERGLOW OF A HELIUM PLASMA.
Aktiebolaget Atomenergi, Stockholm (Sweden).
J. Stevefelt. Feb 68, 49p AE-311

Descriptors: *Atomic recombination, *Helium afterglow, *Helium plasma, *Spectrometers, Electric discharges, Electron energy, Hot cathodes, Ionic collisions, Ionization potentials, Photomultiplier tubes, Quenching.

For abstract, see STAR 06 12.
N68-22073 HC$3.00 MF$0.65

PENNING DISCHARGE IN A STRONGLY INHOMOGENEOUS MAGNETIC MIRROR FIELD.
Royal Inst. of Tech., Stockholm (Sweden). Plasma Physics Div.
N. Hopfgarten, R. B. Johansson, B. Nilsson, and H. Persson. Mar 68, 22p REPT.-68-05
Subm- Submitted for Publication

Descriptors: *Gas discharge tubes, *Magnetic mirrors, *Penning discharge, Electric potential, Magnetic fields, Mean free path, Particle energy, Plasma physics, Volt-ampere characteristics.

For abstract, see STAR 06 12.
N68-22157 HC$3.00 MF$0.65

MEASUREMENT OF THE CONDUCTIVITY AND OF THE VELOCITY OF A DENSE PLASMA ACCELERATED BY AN MF ELECTROMAGNETIC FIELD.
Mesure de La Conductivity Et de La Vitesse D'un Plasma Dense Accelere Par Un Champ Electromagnetique Moyenne Frequence
Office National D Etudes Et de Recherches Aerospatiales, Paris (France).
G. Fournier, J.-P. Rager, and B. Sitt. 1968, 15p CONERA-TP-543
Lang- in French Conf- Presented At the Colloq. on Interaction of High Freq. Fields With A Plasma. Saclay. France, 15-18 Jan. 1968 Subm- Submitted for Publication

Descriptors: *Electromagnetic fields, *Flow velocity, *Plasma conductivity, Annular flow, Current density, Electric fields, Intake systems, Magnetic fields, Particle acceleration, Plasmas (physics), Temperature.

For abstract, see STAR 06 12.
N68-22164 HC$3.00 MF$0.65

SCREENING OF A HIGH-DENSITY PLASMA FROM NEUTRAL GAS PENETRATION.
Royal Inst. of Tech., Stockholm (Sweden). Plasma Physics Div.
B. Lehnert. 18 Mar 68, 29p REPT.-68-06

Descriptors: *Cold gas, *Gaseous self-diffusion, *Plasma diffusion, *Screen effect, Boundary layers, Ion density (concentration), Magnetic fields, Plasma control, Plasma density, Plasma dynamics.

For abstract, see STAR 06 12.
N68-22189 HC$3.00 MF$0.65

ADMITTANCE OF THE INFINITE CYLINDRICAL ANTENNA IN A LOSSY PLASMA. 3 - THE COMPRESSIBLE, MAGNETOPLASMA.
Michigan Univ., Ann Arbor. High Altitude Engineering Lab.
For primary bibliographic entry see Field 9F.
For abstract, see STAR 06 12.
N68-22321 HC$3.00 MF$0.65

INJECTION OF A PLASMA INTO A CLOSED MAGNETIC TRAP WITH A DOUBLE-HELIX FIELD.
Inzhektsiya V Zamknutuyu Magnitnuyu Lovushku S Dvukhodnym Vintovym Polem
Scripta Technica, Inc., Washington, D. C.
G. M. Batanov, G. I. Fedyanin, S. YE.Grebenshchikov, M. A. Ivanovskiy, and I. S. Sbitnikova. Apr 68, 19p NASA-TT-F-11631
Contract NASW-1694
Coll- 19 P Refs Tran- Transl. Into English From the Publ. "fizika Plazmy" Moscow, Nauka Press, 1966 P 7-19

Descriptors: *Injection, *Plasma control, *Trapped magnetic fields, Closed cycles, Curves (geometry), Plasma density, Stellarators, Toroidal plasmas.

For abstract, see STAR 06 12.
N68-22330 HC$3.00 MF$0.65

ON SOME QUESTION OF ELECTROMAGNETIC WAVES DIFFRACTION ON PLASMA FORMATIONS.
Volt Technical Corp., Washington, D. C.
V. B. Gildenburg, I. G. Kondratyev, M. A. Miller, and YU. M.Zhidko. 30 Apr 68, 21p NASA-CR-94361, ST-PP-EMWD-AI-10707
Contract NAS5-12487
Tran- Transl. Into English From Izv. Vysshikh Uchebn. Zavedenii, Radiofiz. (USSR), V. 10, No. 9-10, P 1358-1375

Descriptors: *Electromagnetic wave transmission, *Plasma diagnostics, *Plasma-particle interactions, *Wave diffraction, Light scattering, Plasma density, Plasma physics, Theoretical physics, Wave propagation.

For abstract, see STAR 06 12.
N68-22366 HC$3.00 MF$0.65

A RESUME OF RESEARCH ON COAXIAL PLASMA GUNS PERFORMED AT LEWIS RESEARCH CENTER.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
C. J. Michels. 1968, 18p NASA-TM-X-52431
Conf- Presented At the Seminar on Coaxial Plasma Guns, Catholic Univ. of America, Wash., D. C., 10 May 1968

Descriptors: *Coaxial plasma accelerators, *Plasma guns, *Spacecraft propulsion, Argon, Capacitors, Gun propellants, Mass distribution.

For abstract, see STAR 06 12.
N68-22389 HC$3.00 MF$0.65

CALCULATION METHOD OF THE DISPERSION RELATION OF A HOMOGENEOUS PLASMA.
Methode de Calcul de La Relation de Dispersion D Un Plasma Collisionnel
Commissariat A L Energie Atomique, Fontenay-Aux-roses (France). Groupe de Recherches de L Association Euratom.
C. Lafleur. Dec 67, 8p CEA-R-3413, EUR-3585.F
Lang- in French

Descriptors: *Density distribution, *Diffusion theory, *Plasma diffusion, Chandrasekhar equation, Collisionless plasmas, Eigenvalues, Fokker-planck equation, Kinetic equations, Plasma density.

For abstract, see STAR 06 12.
N68-22704 HC$3.00 MF$0.65

RADIATION FROM SOURCES IMMERSED IN A PARTLY IONIZED GAS.
Case Inst. of Tech., Cleveland, Ohio.
D. J. Connolly. 1968. 55p NASA-CR-94392, A-41
Grant NSG-198

Descriptors: *Mathematical models, *Wave equations, Current distribution, Electron plasma, Fluid flow, Hydrodynamics, Ionized gases, Plasma oscillations, Plasma physics, Radiation sources.

For abstract, see STAR 06 12.
N68-22708 HC$3.00 MF$0.65

COMPUTED DATA FOR PHOENIX 2 - PLASMA DENSITY AND VELOCITY DISTRIBUTIONS, SINGLE PARTICLE BEHAVIOUR, AND DETECTOR EFFICIENCIES.
United Kingdom Atomic Energy Auth rity, Culham (England).
G. Kuo-petravic, M. Petravic, A. C. Riviere, C. A. Steed, and D. R. Sweetman. Sep 67, 22p
CLM-R-76

Descriptors: *Computer programs, *Plasma density, *Plasma dynamics, *Plasma probes, Measuring instruments, Numerical analysis, Particle motion, Velocity distribution.

For abstract, see STAR 06 12.
N68-22731 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF THE FUNDAMENTAL MODES OF A COLLISIONLESS PLASMA FINAL REPORT, 10 MAR. 1964 - 31 OCT. 1967.
Gulf General Atomic, San Diego, Calif.
D. K. Bhadra, D. L. Book, J. H. Malmberg, C. D. Moore, and L. D. Pearlstein. 23 Nov 67, 129p
NASA-CR-94430, GA-8375
Contract NAS7-275

Descriptors: *Collisionless plasmas, *Cyclotron frequency, *Electromagnetic noise, *Plasma diffusion, *Plasma waves, Electron beams, Landau damping, Rotating plasmas, Wave propagation.

For abstract, see STAR 06 12.
N68-22847 HC$3.00 MF$0.65

AN EXPERIMENTAL INVESTIGATION OF SHOCK WAVES IN HIGHLY IONIZED HELIUM.
Case Western Reserve Univ., Cleveland, Ohio.
G. L. Spencer. Jun 66, 83p NASA-CR-94395, A-43
Grant NSG-198

Descriptors: *Helium plasma, *Ionized gases, *Shock waves, Afterglows, Electron flux density, Gas dynamics, Magnetic fields, Magnetohydrodynamics.

For abstract, see STAR 06 12.
N68-22854 HC$3.00 MF$0.65

PERIODIC, SMALL-AMPLITUDE SOLUTIONS TO THE SPATIALLY UNIFORM PLASMA CONTINUITY EQUATIONS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. R. Roth. May 68, 43p NASA-TN-D-4472
Contract 129-02-03-05-22

Descriptors: *Continuity equation, *Electron density (concentration), *Plasma oscillations, *Plasmas (physics), Amplitudes, Approximation, Differential equations, Electron oscillations, Mathematical models, Plasma physics.

For abstract, see STAR 06 12.
N68-22887 HC$3.00 MF$0.65

CHRONOLOGICAL STUDY OF BERYLLIUM PLASMA PRODUCED BY A LASER BEAM.
Etude Chronologique Du Plasma de Beryllium Cree Par le Faisceau D'un Laser
Commissariat A L Energie Atomique, Saclay (France).
J.-C. Buges, Y. Durand, P. Langer, and G. Tonon. Dec 67, 60p CEA-R-3296
Lang- in French, English Summary

Descriptors: *Beryllium, *Nonuniform plasmas, *Plasma diagnostics, *Ruby lasers, Cinematography, Interferometry, Ion emission, Ionization, Optical emission spectroscopy, Radiation detectors, Ultraviolet spectroscopy.

For abstract, see STAR 06 12.
N68-22998 HC$3.00 MF$0.65

REPORT OF AD HOC PANEL ON LOW-BETA TOROIDAL PLASMA RESEARCH.
Ad Hoc Panel on Low-Beta Toroidal Plasma Research.
For primary bibliographic entry see Field 18A.
For abstract, see NSA 22 10.
TID-24228 HC$3.00 MF$0.65

20J. Quantum Theory

HYDROGEN-LIKE ANALYTIC ORBITALS OF ATOMIC SPECIES OF CARBON AND OXYGEN TYPE (ANGLIES IR DEGUONIES TIPO ATOMU VANDENILISKOS ANALIZINES BANGINES FUNKCIJOS),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 159 HC$3.00 MF$0.65

CALCULATION OF THE SPLITTING OF A TRIPLET TERM OF THE POSITIVE ION OF NITROGEN (TRIPLETINIO TERMO SUSKILIMO SKAICIAVIMAS TEIGIAMO AZOTO IONO ATVEJU),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 160 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD IN THE MULTICONFIGURATION APPROXIMATION FOR THE NEGATIVE ION OF POTASSIUM (SAMOSOGLASOVANNOE POLE FOKA V MNOGOKONFIGURATSIONNOM PRIBLIZHENII DLYA OTRITSATELNOGO IONA KALIYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 161 HC$3.00 MF$0.65

A REFINED METHOD OF CALCULATION FOR AN EXCITED POSITIVE ION OF CARBON (UTOCHNENNYI METOD RASCHETA V SLUCHAE VOZBUZHDENNOGO POLOZHITELNOGO IONA UGLERODA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 166 HC$3.00 MF$0.65

THE FORMS OF THE EQUATIONS OF THE SELF-CONSISTENT FIELD (O VIDAKH URAVNENII SAMOSOGLASOVANNOGO POLYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 167 HC$3.00 MF$0.65

THE FOCK SELF-CONSISTENT FIELD IN THE MULTICONFIGURATION APPROXIMATION FOR THE HELIUM ATOM (SAMOSOGLASOVANNOE POLE FOKA V MNOGOKONFIGURATSIONNOM PRIBLIZHENII DIYA ATOMA GELIYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 168 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD FOR DOUBLY IONIZED NITROGEN (SAMOSOGLASOVANNOE POLE FOKA DYLA DVUKRATNOGO IONA AZOTA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 169 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD IN THE TWO-CONFIGURATION APPROXIMATION FOR NITROGEN IN VARIOUS DEGREES OF IONIZATION (SAMOSOGLASOVANNOE POLE FOKA V DVUKHKONFIGURATSIONNOM PRIBLIZHENII DLYA ATOMA AZOTA V RAZNYKH STEPENYAKH IONIZATSII),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 170 HC$3.00 MF$0.65

TWO-CONFIGURATION APPROXIMATION FOR THE CALCIUM ATOM (DVUKHKONFIGURATSIONNOE PRIBLIZHENIE V SLUCHAE ATOMA KALTSIYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 171 HC$3.00 MF$0.65

THE MATHEMATICAL PROBLEM OF THE MULTICONFIGURATION APPROXIMATION (MATEMATICHESKAYA ZADACHA MNOGOKONFIGURATSIONNOGO PRIBLIZHENIYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 172 HC$3.00 MF$0.65

APPROXIMATE ORBITALS FOR EXCITED LEVELS OF THE POSITIVE ION OF OXYGEN (PRIBLIZHENNE ODNOELEKTRONNYE VOLNOVYE FUNKTSII DLYA VOZBUZHDENNYKH UROVNEI POLOZHITELNOGO IONA KISLORODA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 173 HC$3.00 MF$0.65

SIMPLIFYING THE FOCK EQUATIONS (K VOPROSU OB UPROSHCHENII URAVNENII FOKA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 174 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD IN THE TWO-CONFIGURATION APPROXIMATION FOR ATOMIC SPECIES OF BORON TYPE (SAMOSOGLASOVANNOE POLE FOKA V DVUKHKONFIGURATSIONNOM PRIBLIZHENII DLYA ATOMOV TIPA BORA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 175 HC$3.00 MF$0.65

HARTREE SELF-CONSISTENT FIELD IN THE TWO-CONFIGURATION APPROXIMATION FOR THE TWO LOWEST CONFIGURATIONS OF THE CARBON ATOM (SAMOSOGLASOVANNOE POLE KHARTRI V DVUKHKONFIGURATSIONNOM PRIBLIZHENNII DYLA DVUKH NIZSHIKH KONFIGURATSII ATOMA UGLEROGDA),

Group 20J — Quantum theory

American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 176 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD FOR THE POSITIVE ION OF NITROGEN (SAMOSOGLASOVANNOE POLE FOKA DLYA POLOZHITELNOGO IONA AZOTA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 177 HC$3.00 MF$0.65

THE MULTICONFIGURATION APPROXIMATION FOR ATOMIC SPECIES OF HELIUM TYPE (MNOGOKONFIGURATSIONNOE PRIBLIZHENIE V SLUCHAE ATOMOV TIPA GELIYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 178 HC$3.00 MF$0.65

SELECTION OF INITIAL DATA FOR NUMERICAL SOLUTION OF SELF-CONSISTENT-FIELD EQUATIONS (O PODBORE ISKHODNYKH DANNYKH PRI CHISLENNOM RESHENII URAVENENII SAMOSOGLASOVANNOGO POLYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 181 HC$3.00 MF$0.65

THE FOCK SELF-CONSISTENT FIELD FOR A 6D VALENCE ELECTRON IN THE LITHIUM ATOM (SAMOSOGLASOVANNOE POLE FOKA V SLUCHAE VALENTNOGO ELEKTRONA 6D ATOMA LITIYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 182 HC$3.00 MF$0.65

RESULTS OF THE EVALUATION OF HARTREE PARAMETERS OF HYDROGEN-LIKE ORBITALS (NEKOTORYE REZULTATY PO OPREDELENIYU KHARTIEVSKIKH PARAMETROV VODORODOPODOBNYKH ODNOELEKTRONNYKH VOLNOVYKH FUNKSII),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 183 HC$3.00 MF$0.65

APPLICATION OF THE METHOD OF PARTIAL SEPARATION OF VARIABLES TO TWO EQUIVALENT p ELECTRONS (PRIMENENIE METODA NEPOLNOGO RAZDELENIYA PEREMENNYKH K DVUM EKVIVALENTNYM P-ELEKTRONAM),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 184 HC$3.00 MF$0.65

FRACTIONAL PARENTAGE COEFFICIENTS OF A CONFIGURATION WITH SEVERAL SHELLS (GENEALOGICHESKIE KOEFFITSIENTY KONFIGURATSII S NESKOLKIMI OBOLOCHKAMI),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 185 HC$3.00 MF$0.65

FOCK SELF-CONSISTENT FIELD IN THE TWO-CONFIGURATION APPROXIMATION FOR THE FIRST EXCITED CONFIGURATION OF BORON (SAMOSOGLASOVANNOE POLE FOKA V DVUKHKONFIGURATSIONNOM PRIBLIZHENII DLYA PERVOI VOZBUZHDENNOI KONFIGURATSI ATOMA BORA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 186 HC$3.00 MF$0.65

SOLUTION OF THE FOCK EQUATIONS FOR THE BERYLLIUM ATOM IN A TWO-CONFIGURATION APPROXIMATION (RESHENIE URAVNENII FOKA DLYA ATOMA BERILLIYA V DVUKHKON-FIGURATSIONNOM PRIBLIZHENII),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 188 HC$3.00 MF$0.65

TWO-CONFIGURATION APPROXIMATION FOR ATOMIC SPECIES OF NITROGEN TYPE (DVUKHKONFIGURATSIONNOE PRIBLIZHENENIE V SLUCHAE ATOMOV TIPA AZOTA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 191 HC$3.00 MF$0.65

PROPERTIES OF ORBITALS IN THE EXTENDED METHOD OF CALCULATION (O SVOISTVAKH VOLNOVYKH FUNKTSII V RASSHIRENNOM METODE RASCHETA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 193 HC$3.00 MF$0.65

TWO-CONFIGURATION APPROXIMATION FOR THE CONFIGURATION 1s (2)2s (2)2p3s OF CARBON (DVUKHKONFIGURATSIONNOE PRIBLIZHENIE V SLUCHAE KONFIGURATSII 1s (2)2s (2)2p3s ATOMA UGLERODA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 195 HC$3.00 MF$0.65

THEORETICAL DETERMINATION OF THE PROBABILITY OF AN ELECTRIC QUADRUPOLE TRANSITION (K VOPROSU O TEORETICHESKOM OPREDELENII VEROYATNOSTI ELEKTRICHESKOGO KVADRUPOLNOGO PEREKHODA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 196 HC$3.00 MF$0.65

FORMULATION OF APPROXIMATE RADIAL ORBITALS (K VOPROSU O POSTROENII PRIBLIZHENNYKH RADIALNYKH VOLNOVYKH FUNKSTII),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 197 HC$3.00 MF$0.65

APPLICATION OF THE MULTICONFIGURATION APPROXIMATION TO ATOMIC SPECIES OF CARBON, NITROGEN, AND OXYGEN TYPE (K VOPROSU O PRIMENENII MNOGOKONFIGURATSIONNOGO PRIBLIZHENIYA V SLUCHAE ATOMOV TIPA UGLERODA, AZOTA I KISLORODA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 198 HC$3.00 MF$0.65

MULTICONFIGURATION APPROXIMATION FOR THE CASE OF EQUIVALENT ELECTRONS (MNOGOKONFIGURATSIONNOE PRIBLIZHENIE V SLUCHAE EKVIVALENTNYKH ELEKTRONOV),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 199 HC$3.00 MF$0.65

THEORETICAL DETERMINATION OF THE ISOTOPE SHIFT IN THE SPECTRA OF HELIUM AND THE POSITIVE LITHIUM ION (O TEORETICHESKOM OPREDELENII IZOTOPICHESKOGO SMESHCHENIYA V SPEKTRE GELIYA I POLOZHITELNOGO IONA LITIYA),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 7D.
AD-669 200 HC$3.00 MF$0.65

TECHNICAL REPORT 1967.
Chicago Univ Ill Lab of Molecular Structure and Spectra
For primary bibliographic entry see Field 7D.
AD-669 285 Not available from CFSTI.

INTERPOLATION METHOD FOR THE MANY-BODY PROBLEM,
New York Univ N Y Courant Inst of Mathematical Sciences
L. Kijewski, and J. K. Percus. 12 May 67, 10p
NYO-1480-95
Contract AT (30-1)-1480, Grant AF-AFOSR-945-65
Availability: Published in Journal of Mathematical Physics, v8 n11 p2184-93 Nov 1967.

Descriptors: (*Quantum mechanics, Interpolation), Interactions, Problem solving, Wave functions, Ground state, Free energy, Matrix algebra, Mathematical models, Temperature, Statistical mechanics, Errors, Perturbation theory, Spin.
Identifiers: Variational principles.

Variational principles for lower bounds to the energy, or free energy for $T > 0$ deg., of many-body systems are obtained in a form requiring density matrix minimization subject to certain model restrictions. The latter restrict the domain in which the density matrices can vary, and only utilize the energy--or free energy--for the model Hamiltonian H sub M. Increasingly accurate bounds are obtained as the model system begins to resemble the system of interest, and the behavior of the error as H - H sub M approaches zero is shown by two examples based upon the Ising model. Coupling the lower bound principle for the free energy with the standard Gibbs-Bogoliubov upper bound principle results in bounds on generalized susceptibility as well. (Author)
AD-669 292 Not available from CFSTI.

TABLE OF HARTREE-FOCK SELF CONSISTENT FIELD WAVE FUNCTIONS WITH EXCHANGE. SUPPLEMENT IV.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 7D.
AD-669 355 HC$3.00 MF$0.65

NOTE ON NONLINEAR REALIZATIONS OF CHIRAL SYMMETRY,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 20H.
AD-669 413 Not available from CFSTI.

ANOMALOUS AND NORMAL SINGULARITIES AND THE INFINITE-MOMENTUM LIMIT,
Yeshiva Univ New York Belfer Graduate School of Science
For primary bibliographic entry see Field 20H.
AD-669 472 Not available from CFSTI.

GEOMETRIC THEORY OF THE SPIN-WEIGHTED FUNCTIONS,
Syracuse Univ N Y
A. Staruszkiewicz. May 68, 4p
AFOSR-68-0979
Grant AF-AFOSR-789-66
Availability: Published in Journal of Mathematical Physics, v8 n11 p2221-2 Nov 1967.

Descriptors: (*Functions, Algebraic topology), Algebras, Special functions (Mathematical), Operators (Mathematics), Groups (Mathematics), Transformations (Mathematics), Momentum, Wave functions, Quantum mechanics.
Identifiers: Spin-weighted functions, Pensov objects.

The spin weighted functions introduced recently are shown to be eigen-functions of the total angular momentum for appropriately defined geometric

objects on the sphere, namely the Pensov objects. (Author)
AD-669 540 Not available from CFSTI.

A FURTHER ADIABATIC INVARIANCE OF THE ACTION INTEGRAL FOR THE HARMONIC OSCILLATOR.
Interim rept.,
Barcelona Univ (Spain) Instituto de Fisica Teorica
A. Bramon, and L. Navarro. Jan 67, 5p
AFOSR-68-1003
Grant AF-EOAR-17-64
Availability: Published in Anales de la Real Sociedad Espanola de Fisica y Quimica, v63 serA p259-62 Sep-Oct 1967.

Descriptors: (*Equations of motion, Particles), (*Quantum mechanics, Correlation techniques), Harmonic generators, Hamiltonian, Invariance, Transformations (Mathematics), Periodic variations.
Identifiers: Action principle.

It is shown that the action integral of the harmonic oscillator whose frequency changes slowly with time is an adiabatic invariance of the order m+1. Its assumed that the m first time derivatives of the Hamiltonian are zero initially and finally. (Author)
AD-669 554 Not available from CFSTI.

NUMERICAL TECHNIQUES IN MATRIX MECHANICS,
California Univ Berkeley Dept of Physics
Charles Schwartz. 27 Mar 68, 26p
AFOSR-68-1057
Grant AF-AFOSR-130-66
Availability: Published in Journal of Computational Physics, v2 n2 p80-113 November 1967.

Descriptors: (*Quantum mechanics, *Matrix algebra), Approximation (Mathematics), Potential theory, Wave functions, Hydrogen, Atomic energy levels, Ground state, Helium, Nuclear scattering, Numerical analysis.

A presentation is given with numerical examples, of several approximation techniques for solving some model problems in quantum mechanics. The emphasis is on matrix representations rather than differential or integral equations. Some of the methods are already known (extensions of the variational principle) and others are believed to be novel. (Author)
AD-669 643 Not available from CFSTI.

DERIVATION OF THE PRINCIPLE OF COMPENSATION OF DANGEROUS DIAGRAMS.
Uppsala Univ (Sweden) Quantum Chemistry Group
For primary bibliographic entry see Field 20C.
AD-669 669 Not available from CFSTI.

SIMPLE AMO FUNCTION FOR THE LITHIUM MOLECULE,
Uppsala Univ (Sweden) Quantum Chemistry Group
For primary bibliographic entry see Field 7D.
AD-669 672 Not available from CFSTI.

X-RAY SCATTERING FACTORS COMPUTED FROM NUMERICAL HARTREE-FOCK WAVE FUNCTIONS,
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 22 10.
LA-3816 HC$3.00 MF$0.65

ON THE FUNCTIONAL FORMALISM IN QUANTUM FIELD THEORY.
Laboratoire de Physique Theorique Et des Hautes Energies, Orsay (France). Faculte des Sciences.
M. Dubois-violette. Mar 68, 14p TH/68/6

Descriptors: *Field theory (physics), *Formalism, *Functions (mathematics), *Operators (mathematics), *Quantum theory, Electromagnetic fields, Mathematical models, State vectors.

For abstract, see STAR 06 12.
N68-21848 HC$3.00

REVIEWS OF THE RELATIVISTIC ASPECTS OF THE THREE-BODY PROBLEM - PRACTICAL COMPUTATIONS FORM FACTORS IN S-MATRIX THEORY.
Laboratoire de Physique Theorique Et des Hautes Energies, Orsay (France).
For primary bibliographic entry see Field 20H.
For abstract, see STAR 06 12.
N68-21849 HC$3.00

A LOGICAL CONTRADICTION FROM TACHYONS.
State Univ. of Iowa, Iowa City. Dept. of Physics and Astronomy.
P. D. Noerdlinger. Dec 67, 11p NASA-CR-94241, REPT.-67-73
Grant NSG-233-62

Descriptors: *Mathematical logic, *Particle motion, *Particles, *Relativistic velocity, Emission, Hypotheses, Light speed, Newton theory, Recoilings.

For abstract, see STAR 06 12.
N68-21900 HC$3.00 MF$0.65

NEW SOLUTIONS OF THE THIRRING MODEL.
International Centre for Theoretical Physics, Trieste (Italy).
For primary bibliographic entry see Field 20H.
For abstract, see STAR 06 12.
N68-22158 HC$3.00 MF$0.65

ON LIMITABLE DYNAMICAL GROUPS IN QUANTUM MECHANICS. 1 - GENERAL THEORY AND A SPINLESS MODEL.
International Centre for Theoretical Physics, Trieste (Italy).
H. D. Doebner, and O. Melsheimer. May 67, 52p IC-67-28
Agency Date- May 1967 Coll- 52 P Refs Subm-Submitted for Publication

Descriptors: *Group theory, *Nonrelativistic mechanics, *Quantum mechanics, Lie groups, Mathematical models, Particle interactions, Spin dynamics.

For abstract, see STAR 06 12.
N68-22220 HC$3.00 MF$0.65

CURRENT DEFINITION AND MASS RENORMALIZATION IN A MODEL FIELD THEORY.
International Centre for Theoretical Physics, Trieste (Italy).
C. R. Hagen. Apr 67, 25p IC-67-24
Agency Date- Apr. 1967 Coll- 25 P Refs Subm-Submitted for Publication

Descriptors: *Fermions, *Field theory (physics), *Particle interactions, *Vector mesons, Boson fields, Canonical forms, Equations of motion, Green function, Operators (mathematics), Quantum theory, Spinor groups, Vector currents, Vector spaces.

For abstract, see STAR 06 12.
N68-22282 HC$3.00 MF$0.65

SUM RULES FOR VARIATIONAL WAVE FUNCTIONS.
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
S. T. Epstein. 15 Mar 68, 7p NASA-CR-94597, WIS-TCI-290
Grant NSG-275-62

Descriptors: *Sums, *Variational principles, *Wave functions, Hamiltonian functions, Oscillators, Polarization (waves).

For abstract, see STAR 06 12.
N68-22416 HC$3.00 MF$0.65

EFFECT OF HIGH HYDROSTATIC PRESSURES ON THE SELF-DIFFUSION OF GAMMA URANIUM AND THE NOBLE METALS.
Influence des Pressions Hydrostatiques Elevees Sur L Autodiffusion de L Uranium Gamma Et des Metaux Nobles
Commissariat A L Energie Atomique, Saclay (France).
Y. Adda, M. Beyeler, and B. Pernot. Oct 67, 29p
CEA-R-3316
Lang- in French

Descriptors: *Hydrostatic pressure, *Molecular diffusion, *Noble metals, *Pressure effects, *Uranium, Crystal structure, Diffusion theory, Gamma rays, High pressure, Polycrystals, Single crystals.

For abstract, see STAR 06 12.
N68-23002 HC$3.00 MF$0.65

20K. Solid Mechanics

SOME EFFECTS OF POWDER PARTICLE SIZE ON THE PHYSICAL BEHAVIOR OF PRESS FORGED BERYLLIUM.
Army Materials and Mechanics Research Center Watertown Mass
For primary bibliographic entry see Field 11F.
AD-669 240 HC$3.00 MF$0.65

ENVIRONMENTAL CRACKING IN AISI 4340 STEEL.
Illinois Univ Urbana Dept of Theoretical and Applied Mechanics
For primary bibliographic entry see Field 11F.
AD-669 255 HC$3.00 MF$0.65

VIBRATION MODES AND RANDOM RESPONSE OF A MULTIBAY PANEL SYSTEM USING FINITE ELEMENTS,
National Aeronautical Establishment Ottawa (Ontario)
Garry M. Lindberg, and Mervyn D. Olson. Dec 67, 68p Rept no. NAE-LR-492
NRC-10001

Descriptors: (*Panels (Structural), Vibration), Response, Stresses, Equations of motion, Torsion, Loading (Mechanics), Canada.

A finite element approach to the dynamic analysis of continuous skin-stringer panels is presented. The method is illustrated in the calculation of vibration modes and random response of a five-bay stringer-stiffened panel with all outer edges clamped. The panel skin is represented by finite plate elements and the stringers, which are assumed infinitely stiff in bending, are represented by beam torsional elements. Results are presented for the first 35 panel vibration modes. These modes occur in distinct groups with five similar modes in each, the number five corresponding to the number of panel bays. The response of the panel to plane wave propagation of acoustic noise (propagating normal to the stringers) is also calculated. The resulting response power spectral densities were found to be fundamentally different from those associated with single span panels. These power spectra did not have widely separated peaks, but rather the peaks tended to be squeezed into groups corresponding to the groupings of natural frequencies for the panel. (Author)
AD-669 294 HC$3.00 MF$0.65

ANALYSIS OF PIN-JOINTED SPACE FRAMEWORKS: NONLINEAR EFFECTS.

Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
For primary bibliographic entry see Field 13M.
AD-669 333 HC$3.00 MF$0.65

TEST PROCEDURE FOR THE FREE-FREE GROUND VIBRATION TESTS ON THE ASSEMBLED OAO SPACECRAFT, AGENA, ATLAS, AND FAIRINGS AT POINT LOMA,
General Dynamics/Astronautics San Diego Calif
For primary bibliographic entry see Field 22B.
AD-669 367 HC$3.00 MF$0.65

NSF ADVANCED SCIENCE SEMINAR IN ROCK MECHANICS FOR COLLEGE TEACHERS OF STRUCTURAL GEOLOGY 26 JUNE - 28 JULY 1967, BOSTON COLLEGE, CHESTNUT HILL, MASS. VOLUME I,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 8G.
AD-669 375 MF$0.65

NSF ADVANCED SCIENCE SEMINAR IN ROCK MECHANICS FOR COLLEGE TEACHERS OF STRUCTURAL GEOLOGY 26 JUNE - 28 JULY 1967, BOSTON COLLEGE, CHESTNUT HILL, MASS. VOLUME II,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 8G.
AD-669 376 MF$0.65

FATIGUE TEST RESULTS AND ANALYSIS OF 11 PISTON PROVOST WINGS TO DETERMINE THE EFFECT OF ORDER OF PROGRAMMED LOAD,
British Aircraft Corp Ltd London (England)
For primary bibliographic entry see Field 1C.
AD-669 414 HC$3.00 MF$0.65

FATIGUE TEST RESULTS AND ANALYSIS OF FOUR PISTON PROVOST WINGS TESTED IN AN ASCENDING-DESCENDING ORDER OF LOADING,
British Aircraft Corp Ltd London (England)
For primary bibliographic entry see Field 1C.
AD-669 415 HC$3.00 MF$0.65

PARALLEL PLATE PLASTOMETRY OF PLASTIC PROPELLANT: PART I: DETERMINATION OF YIELD STRESS,
Explosives Research and Development Establishment Waltham Abbey (England)
For primary bibliographic entry see Field 21I.
AD-669 423 HC$3.00 MF$0.65

SPALL FRACTURE AND DYNAMIC RESPONSE OF MATERIALS.
Summary rept.,
Battelle Memorial Inst Columbus Ohio Columbus Labs
John H. Oscarson, and Karl F. Graff. 21 Mar 68, 132p Rept no. BAT-197A-4-3
Contract DA-49-083-OSA-3176, ARPA Order-197

Descriptors: (*Materials, Fracture (Mechanics)), Brittleness, Shock waves, Theory, Stresses, Continuum mechanics, Mathematical models, Crack propagation, Plasticity, Metals, Creep, Propagation.
Identifiers: Spalling, *Brittle materials, *Ductile materials.

The report describes the time-dependent fracture, or spalling, of materials as a result of dynamic response to shock-wave or impulse loading. From stress-wave and fracture-mechanics theory and assuming knowledge of the dynamic properties of the material, theories are developed to predict the stress at the spall plane. The cumulative, energy, stress-rate, and bond-breaking models for the prediction of spall fracture are described, along with the basic criteria of each model. (Author)
AD-669 440 HC$3.00 MF$0.65

VARIABLES AFFECTING STRENGTH AND MODULUS OF SHORT FIBER COMPOSITES,
Monsanto Research Corp St Louis Mo
For primary bibliographic entry see Field 11D.
AD-669 475 Not available from CFSTI.

VIBRATIONS OF CURVED BEAMS.
North Carolina State Univ Raleigh Dept of Mechanical and Aerospace Engineering
For primary bibliographic entry see Field 13M.
AD-669 493 HC$3.00 MF$0.65

FREE VIBRATIONS OF RING-AND-STRINGER-STIFFENED CONICAL SHELLS.
Technical rept.,
Houston Univ Tex Dept of Mechanical Engineering
Otto E. Crenwelge, Jr., and D. Muster. Apr 68, 116p Rept no. TR-9
Contract Nonr-4492 (01)

Descriptors: (*Structural shells, Vibration), Conical bodies, Reinforcing materials, Resonant frequency, Rings, Computer programs, Theory, Dynamics, Strain (Mechanics), Beams (Structural), Guided missile components, Staging, Adapters.
Identifiers: *Interstage adapters (Aerospace).

Strain-displacement relations are developed for a thin truncated circular conical shell and its reinforcing rings and stringers. Using these relations in an energy approach, methods are developed for determining the resonant frequencies of simply-supported conical shells in unstiffened, ring-stiffened, or ring-and-stringer-stiffened configurations. The stiffeners may be either widely-separated or closely-spaced. Results obtained using these methods are compared with experimental data available in the literature for unstiffened and ring-stiffened shells and data collected in tests of ring-stiffened and ring-and-stringer-stiffened conical shells. (Author)
AD-669 499 HC$3.00 MF$0.65

INDEX TO THE SHOCK AND VIBRATION BULLETINS,
Shock and Vibration Information Center (Defense) Washington D C
R. E. Seely, Henry C. Pusey, and Jean B. Goldbecker. Feb 68, 230p

Descriptors: (*Shock (Mechanics), Reports), (*Vibration, Indexes), Documentation, Ordnance, Ships, Structures, Logistics, Air drop operations, Impact shock, Vibration isolators, Damping, Aircraft landings, Damage assessment, Environment, Transportation, Protection, Packaging, Design, Shock resistance, Guided missiles.

The index lists publications dealing with shock and vibration by title, author, content and bulletin location for the years 1947 to 1966.
AD-669 509 HC$3.00 MF$0.65

ON THE DEVELOPMENT OF THE THEORY OF THIN WALLED CONSTRUCTIONS IN ESTONIAN SSR (O RAZVITII TEORII TONKOSTENNYKH KONSTRUKTSII V ESTONSKOI SSR),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13M.
AD-669 519 HC$3.00 MF$0.65

CRACK EXTENSION BY ALTERNATING SHEAR,
Boeing Scientific Research Labs Seattle Wash Solid State Physics Lab
For primary bibliographic entry see Field 11F.
AD-669 531 HC$3.00 MF$0.65

INVESTIGATION OF PRECURSOR DECAY IN IRON BY THE ARTIFICIAL VISCOSITY METHOD,
Washington State Univ Pullman Dept of Physics
James N. Johnson, and William Band. 10 May 68, 9p
AFOSR-68-1005
Grant AF-AFOSR-1088-66

Descriptors: (*Iron, Shock waves), (*Dislocations, Shock waves), (*Shock waves, Propagation), Metal plates, Impact shock, Shear stresses, Strain (Mechanics), Plasticity, Elasticity, Mathematical models.
Identifiers: Artificial viscosity method.

The artificial viscosity method of von Neumann and Richtmyer is used to calculate the flow field for a shocked, elastic-plastic-relaxing solid; particular material parameters are chosen to represent the rate-dependent behavior of iron. The constitutive relation is based on the dislocation model for plastic flow. Dislocation velocity is assumed to be a unique function of shear stress as given by Gilman and Johnston. Two models for dislocation multiplication are studied. The first is the multiple-cross-glide model discussed by Gilman, and the second is one in which pinned dislocations become sources of new mobile dislocations in the sense of the Frank-Read multiplication process. Artificial viscosity calculations yield precursor amplitudes which are sometimes considerably different from those obtained from characteristic theory of precursor decay. These differences are believed to be due to the finite width of the elastic wave front provided by the viscosity. With proper choice of mesh size in the artificial viscosity calculations, a decrease in stress can be seen immediately behind the elastic precursor. This agrees qualitatively with experimentally determined shock profiles in iron. (Author)
AD-669 536 Not available from CFSTI.

A FURTHER ADIABATIC INVARIANCE OF THE ACTION INTEGRAL FOR THE HARMONIC OSCILLATOR.
Barcelona Univ (Spain) Instituto de Fisica Teorica
For primary bibliographic entry see Field 20J.
AD-669 554 Not available from CFSTI.

A REVIEW OF SPECIAL TECHNIQUES FOR MEASURING PLASTIC STRAIN.
Technical rept.,
Stanford Univ Calif Dept of Materials Science
T. R. Wilshaw. Apr 68, 48p Rept nos. TR-8, SU-DMS-68-T-74
AROD-4800:11-MC
Contract DA-31-124-ARO (D)-251

Descriptors: (*Strain (Mechanics), Measurement), (*Dislocations, Optical analysis), Plasticity, Deformation, Hardness, Stresses, Fatigue (Mechanics), Photoelasticity, Grain boundaries, Etched crystals, Cracks, Single crystals, X-ray diffraction analysis, Electron microscopy, Alloys, Reviews.
Identifiers: Moire patterns, Microstructure.

For simplicity, the techniques for measuring plastic strain are divided into two sections: (a) those which measure only surface strains and (b) those which are also capable of measuring internal strains. These latter techniques are of special interest and will be discussed in detail. The techniques in Section A will only be briefly dealt with for completeness as more detailed treatments are available elsewhere. Broadly the techniques fall into two categories: firstly, direct observations of the displacements associated with the strains, e.g., grids, moire fringes, and direct observations of dislocations, and secondly, indirect methods in which measurements are compared with a set of calibrated standards, e.g., etch pits, microhardness, and S-ray methods. (Author)
AD-669 633 HC$3.00 MF$0.65

ADVANCES IN FRACTURE TOUGHNESS CHARACTERIZATION PROCEDURES AND IN

QUANTITATIVE INTERPRETATIONS TO FRACTURE-SAFE DESIGN FOR STRUCTURAL STEELS.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 11F.
AD-669 690 HC$3.00 MF$0.65

SOME MECHANICAL AND THERMODYNAMICAL ASPECTS OF PLASTICITY,
Brown Univ Providence R I Div of Engineering
James R. Rice. Apr 66, 57p Rept no. ARPA-E-31
Contract SD-86

Descriptors: (*Plasticity, Microstructure), Mechanical properties, Thermodynamics, Creep, Irreversible processes, Deformation, Thermal expansion, Free energy.

Some mechanical and thermodynamical results pertaining to the behavior of a macroscopic sample of elastic-plastic material are given, as based on assumptions which idealize certain salient features of plastic flow. At the macroscopic level, a limited range of linear reversible mechanical behavior is assumed to exist with history independent properties relating variations of forces, displacements, and temperature. It is shown that the internal energy and entropy then split additively into macro- and micro-parts, the latter locked into the sample by irreversible deformation and constant during reversible deformation, and the former given by the usual elastic expressions. The second law restriction, for time-independent or dependent behavior, is that macroscopic plastic work must exceed the change in 'locked-in' energy. Modeling plastic flow on a microscopic level as elastic behavior accompanied by material rearrangement through microstructural deformation, in the form of slip on a sufficiently small scale, quantities pertaining to irreversibility such as macroscopic plastic displacements, plastic work, micro-energy, and micro-entropy are evaluated as the works of appropriate forces on the microstructural deformation field. Micro-entropy is found to vanish for material samples exhibiting homogeneous thermal expansion. (Author)
AD-669 695 HC$3.00 MF$0.65

DYNAMIC STABILITY AND PARAMETRIC RESONANCE IN CYLINDRICAL PROPELLANT TANKS FINAL REPORT.
Southwest Research Inst., San Antonio, Tex.
W.-W. Chu, T. D. Dunham, and D. D. Kana. 17 Jan 68, 98p NASA-CR-61725
Contract NAS8-20329

Descriptors: *Cylindrical tanks, *Dynamic stability, *Propellant tanks, Axisymmetric bodies, Donnell equations, Liquid filled shells, Liquid oxygen, Mathieu function, Reinforcement rings, Resonant frequencies, Saturn 5 launch vehicles, Scale models, Stiffening, Ullage.

For abstract, see STAR 06 12.
N68-21873 HC$3.00 MF$0.65

PLASTIC ENCLAVE SIZES FOR INTERNAL CRACKS EMANATING FROM CIRCULAR CAVITIES WITHIN ELASTIC PLATES.
Lehigh Univ., Bethlehem, Pa. Dept. of Mechanical Engineering.
T. Rich. Jun 67, 94p NASA-CR-94296
Contracts NGR-39-007-011, NSF GK-344

Descriptors: *Crack initiation, *Elastic plates, Crack propagation, Graphs (charts), Loads (forces), Modulus of elasticity, Numerical analysis, Plastic deformation, Problem solving, Tensile strength, Theses.

For abstract, see STAR 06 12.
N68-21912 HC$3.00 MF$0.65

THE ROLE OF ENERGY IN DEFORMATION.
General Electric Co., Philadelphia, Pa.
I. J. Gruntfest. Apr 68, 31p NASA-CR-1039
Contract NASW-1190 .

Descriptors: *Energy conversion, *Fracture mechanics, *Plastic deformation, *Yield strength, Analog simulation, Materials tests, Microstructure, Plastic flow, Thermodynamics.

For abstract, see STAR 06 12.
N68-21949 HC$3.00 MF$0.65

BASIC RESEARCH ON LIQUID-DROP-IMPACT EROSION QUARTERLY REPORT, 8 DEC. 1966 - 8 MAR. 1967.
General Electric Co., Cincinnati, Ohio. Missile and Space Div.
O. G. Engel. 8 Mar 67, 32p NASA-CR-84982, QR-2
Contract NASW-1481

Descriptors: *Drops (liquids), *Elastic waves, *Erosion, *Hypervelocity impact, *Light gas guns, Heat treatment, Helium, Hypervelocity guns, Hypervelocity projectiles, Iron, Metal polishing, Spheres, Steels, Tantalum, Targets, Zinc.

For abstract, see STAR 06 12.
N68-22297 HC$3.00 MF$0.65

SOME THOUGHTS ON CUMULATIVE FATIGUE DAMAGE THEORY.
Australian Aeronautical Research Committee, Melbourne. Dept. of Supply.
F. H. Hooke. Apr 67, 25p ARL/SM-315

Descriptors: *Amplitude distribution analysis, *Cyclic loads, *Fatigue (materials), *Load tests, Fatigue life, Fatigue tests, Materials tests, Service life.

For abstract, see STAR 06 12.
N68-22702 HC$3.00 MF$0.65

RANDOM AND SYSTEMATIC FACTORS IN THE SCATTER OF CREEP DATA.
Aeronautical Research Council (Gt. Brit.)
K. F. Walles. 1967, 82p ARC-CP-935, NGTE-NT-601

Descriptors: *Creep properties, *Random variables, Approximation, Castings, Creep tests, Graphs (charts), Stress analysis.

For abstract, see STAR 06 12.
N68-22822 HC$3.00 MF$0.65

METHOD OF CALCULATING THE NORMAL MODES AND FREQUENCIES OF A BRANCHED TIMOSHENKO BEAM.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
F. J. Shaker. May 68, 41p NASA-TN-D-4560
Contract 180-06-06-03-22

Descriptors: *Cantilever beams, *Iterative solution, *Vibration mode, Bending theory, Deflection, Dynamic structural analysis, Flexibility, Launch vehicles, Mathematical models, Shear stress, Structural vibration.

For abstract, see STAR 06 12.
N68-22886 HC$3.00 MF$0.65

NONLINEAR ANALYSIS OF SHELLS OF REVOLUTION BY THE MATRIX DISPLACEMENT METHOD.
Sandia Corp., Albuquerque, N. Mex. Texas A&m Univ., College Station.
W. E. Haisler, H. R. Mac Dougall, F. J. Stebbins, and J. A. Stricklin. Aug 67, 11p NASA-CR-94510, SC-DC-67-2054
Contracts AT/29-1/-789, NGR-44-001-044
Conf- Presented At Aiaa 6th Aerospace Sci. Meeting, New York Prep- Prepared for Sandia Corp., Albuquerque, N. Mex.

Descriptors: *Bodies of revolution, *Displacement, *Matrix methods, *Shell theory, Loads (forces), Numerical analysis, Shell stability, Stress analysis.

For abstract, see STAR 06 12.
N68-22919 HC$3.00 MF$0.65

ON A NONLINEAR THEORY OF ELASTIC SHELLS.
Wayne State Univ., Detroit, Mich.
H. Cohen, and C. N. De Silva. 1966, 13p NASA-CR-94408
Contract NGR-23-006-047

Descriptors: *Elastic deformation, *Elastic shells, *Gradients, *Nonlinear equations, *Structural strain, Algebra, Mechanical properties, Numerical analysis, Shell stability, Shell theory.

For abstract, see STAR 06 12.
N68-22984 HC$3.00 MF$0.65

PILE-SOIL SYSTEM RESPONSE IN CLAY AS A FUNCTION OF EXCESS PORE WATER PRESSURE AND OTHER SOIL PROPERTIES.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 13M.
PB-177 890 HC$3.00 MF$0.65

20L. Solid-State Physics

SEMICONDUCTING DIAMONDS PRODUCED BY ION BOMBARDMENT (POLUPROVODNIKOVYE ALMAZY, POLUCHENNYE METODOM IONNOI BOMBARDIROVKI),
American Meteorological Society Boston Mass
For primary bibliographic entry see Field 8G.
AD-669 189 HC$3.00 MF$0.65

HOT-CARRIER InSb MICROWAVE MODULATION,
Oxford Univ (England) Dept of Engineering Science
B. T. G. Tan. May 68, 1p
AFOSR-68-0963
Grant AF-EOAR-33-67
Availability: Published in Electronics Letters, v3 n11 Nov 1967.

Descriptors: (*Carriers (Semiconductors), Transport properties), (*Indium antimonides, Modulation), Microwave frequency, Modulators, Electric fields, Mobility, Plasma medium, Electrical properties, Attenuation, Impurities.
Identifiers: Hot-carrier effect.

The microwave power absorbed by a rod of p type InSb in Q band waveguide decreased by up to 9 dB when electric fields of up to 126 V/cm were applied to it, probably owing to a hot-carrier effect. (Author)
AD-669 201 Not available from CFSTI.

IMAGING AND STORAGE WITH A UNIFORM MOS STRUCTURE,
Massachusetts Inst of Tech Lexington Lincoln Lab
Robert J. Phelan, Jr., and John O. Dimmock. 18 Oct 67, 4p Rept no. JA-3148
ESD-TR-68-51
Contract AF 19 (628)-5167
Availability: Published in Applied Physics Letters, v11 n11 p359-61 Dec 1 1967.

Descriptors: (*Data storage systems, Semiconductors), (*Indium antimonides, Photosensitivity), Gas lasers, Infrared radiation, Infrared detectors, Ultraviolet radiation, Images, Scanning, Cryogenics, Interfaces.
Identifiers: Metal oxide semiconductors.

Radiation sensitive characteristics of a uniform InSb-metal-oxide-semiconductor (MOS) structure have been used to detect images. By rapid optical scanning this structure with visible light of 0.63

micron, the authors have detected infrared images due to 5-micron radiation. In addition, information can be read-in and stored (or 'photographed') by using 1-micron radiation, nondestructively read-out with 5-micron radiation, and erased with 0.25-micron radiation. (Author)
AD-669 211 Not available from CFSTI.

CRITICAL PROPERTIES OF ISOTROPICALLY INTERACTING CLASSICAL SPINS CONSTRAINED TO A PLANE.
Journal article,
Massachusetts Inst of Tech Lexington Lincoln Lab
Harry E. Stanley. 27 Oct 67, 6p Rept no. JA-3156
ESD-TR-68-52
Contract AF 19 (628)-5167
Prepared in cooperation with Harvard Univ., Cambridge, Mass. Lyman Lab. of Physics.
Availability: Published in Physical Review Letters, v20 n4 p150-4 Jan 22 1968.

Descriptors: (*Magnetic moments, Interactions), (*Crystal lattices, Thermodynamics), Hamiltonian, Specific heat, Transition temperature, Phase studies, Solid state physics.
Identifiers: Heisenberg model, Ising model, Order-disorder theory, Magnetic susceptability.

High-temperature expansions of the susceptibility and internal energy (specific heat) are presented for general lattice structure for a system of isotropically interacting unit vectors (or 'classical spins') which are constrained to lie in a plane. A phase transition (T sub c > 0) is indicated for two-dimensional lattices; the expected result T sub c = 0 is found in one dimension, but only upon choosing a more suitable expansion parameter than J/kT. Similarities with the corresponding expansions of the S=1/2 Ising and classical Heisenberg models are pointed out; in particular, it is found that certain critical properties of this planar model appear to be bounded on one side by the Ising model and on the other side by the Heisenberg model. (Author)
AD-669 213 Not available from CFSTI.

NEW EXPANSION FOR THE CLASSICAL HEISENBERG MODEL AND ITS SIMILARITY TO THE S=1/2 ISING MODEL,
Massachusetts Inst of Tech Lexington Lincoln Lab
Harry Eugene Stanley. 19 Jun 67, 4p Rept no. JA-3090
ESD-TR-68-46
Contract AF 19 (628)-5167
Availability: Published in The Physical Review, v164 n2 p709-11 Dec 10 1967.

Descriptors: (*Magnetic moments, Interactions), (*Crystal lattices, Mathematical models), Approximation (Mathematics), Transition temperature, Phase studies, Solid state physics.
Identifiers: *Heisenberg model, Ising model, Order-disorder theory.

The zero-field susceptibility of the classical Heisenberg model is expanded in the new expansion parameter u is identically equal to L (2J/kT) and a formal similarity with the S=1/2 Ising-model expansion is noted. The new Heisenberg-model expansion is seen to provide more reliable extrapolations (especially for one- and two-dimensional lattices) than heretofore, and to permit comparison with Brown's recent work on the Bethe-Peierls approximation. (Author)
AD-669 216 Not available from CFSTI.

ELECTRON-HOLE PAIR EFFECTS ON LANDAU LEVELS IN InSb,
Massachusetts Inst of Tech Lexington Lincoln Lab
David M. Larsen. 5 Sep 67, 5p Rept no. JA-3126
ESD-TR-68-49
Contract AF 19 (628)-5167
Availability: Published in Physical Review Letters, v19 n19 p11-28-31 Nov 1967.

Descriptors: (*Semiconductors, Indium antimonides), (*Indium antimonides, Band theory of solids), (*Excitons, Interactions), Magnetic fields, Anomalies, Phonons, Wave functions, Carriers (Semiconductors), Perturbation theory, Dielectric properties.
Identifiers: Landau levels, Polarons.

Motivated by a paper of Toyozawa in which the close analogy between the electron-LO-phonon interaction and the electron-Frenkel-exciton interaction is clearly pointed out, the author suggests in this letter that electron-exciton interaction, the interaction which gives rise to electron screening associated with the high-frequency dielectric constant in semiconductors and insulators, should produce in InSb large modification of Landau-level energies near critical field values. (Author)
AD-669 218 Not available from CFSTI.

PERTURBATION CALCULATION OF BAND-STRUCTURE EFFECTS IN LOW-FIELD HELICON PROPAGATION,
Massachusetts Inst of Tech Lexington Lincoln Lab
Alan L. McWhorter, and James N. Walpole. 12 Jul 67, 5p Rept no. JA-3097
ESD-TR-68-47
Contract AF 19 (628)-5167
Availability: Published in The Physical Review, v163 n3 p618-21 Nov 15 1967.

Descriptors: (*Semiconductors, Plasma medium), (*Band theory of solids, Semiconductors), Cyclotron resonance phenomena, Carriers (Semiconductors), Perturbation theory, Interactions, Mobility, Anisotropy, Magnetic fields.
Identifiers: Helicons, Maxwell's equations.

The dispersion relation for low-field helicon propagation in solids with many-valley, ellipsoidal energy surfaces has been calculated in the local limit by a perturbation technique valid to first order in omega/omega sub c and 1/ (omega sub c)tau, where omega sub c is the cyclotron frequency and tau is the collision time. Collision anisotropy has also been included. The results should be useful not only for understanding band-structure effects in helicon propagation but also for band-structure determination in high-mobility semiconductors and alloys and in doped semimetals, where cyclotron resonance experiments are usually difficult to interpret. In addition to the conditions indicated above, omega tau approximately equal to, or > 1 is required for the first-order perturbation results to be adequate for calculating the real part of the propagation constant. (Author)
AD-669 221 Not available from CFSTI.

QUARTERLY PROGRESS REPORT NO. 89,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
For primary bibliographic entry see Field 5B.
AD-669 231 HC$3.00 MF$0.65

INTERNAL PHOTOEMISSION IN EVAPORATED Al-Al2O3-Al THIN FILM DEVICES.
Air Force Avionics Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20C.
AD-669 331 HC$3.00 MF$0.65

INVESTIGATION ON COLOR CENTERS AND LUMINESCENCE IN INSULATING CRYSTALS.
Final scientific rept. 1 Nov 66-31 Dec 67,
Hebrew Univ Jerusalem (Israel) Dept of Physics
Abraham Halperin, Abraham A. Braner, Z. Cohen, J. Shapira, and E. Zacks. Feb 68, 43p Rept no. PDO-168
AFCRL-68-0236
Contract F61052-67-C-0039

Descriptors: (*Dielectrics, *Luminescence), (*Color centers, Dielectrics), Potassium compounds, Bromides, Thermoluminescence, Thermal conductivity, Emissivity, Silicon carbides, Impurities, Iron, Nitrogen, Absorption spectrum, Relaxation time, Quartz, Germanium, Israel.
Identifiers: Potassium bromide.

Thermally stimulated luminescence (TSL) and conductivity (TSC) in KBr, x-excited at LAT were measured simultaneously. Most TSL peaks were correlated to TSC peaks. Re-excitation with F-light resulted in high intensity TSC peaks at 143 and 218K and low TSL at 146 and 223K. V light gave different results. Optical bleaching of the F- or F'-bands increased some and reduced other glow peaks. Hexagonal (6H-alpha SiC) silicon carbide crystals including iron and nitrogen were examined. The absorption showed weak bands at 0.62 and about 0.9 microns. The decay of the blue luminescence nearly fitted a power law with slopes of less than one for decay times up to 2msec. Short wavelength components of the band decayed faster compared with those at longer wavelengths. The TSL showed one glow peak near 115K with an activation energy of 0.12-0.13 ev. The TSL and TSC of a Brazilian natural quartz crystal and a synthetic Ge-doped sample as well as their re-excitation and bleaching effects are also described. (Author)
AD-669 350 HC$3.00 MF$0.65

PURITY-PROPERTY RELATIONSHIPS IN ORGANIC SEMICONDUCTION.
Final rept. 15 Sep 64-14 Sep 67,
Monsanto Research Corp Everett Mass Boston Lab
John S. Driscoll, Stephen C. Kwan, and Abraham W. Berger. Apr 68, 116p* Rept no. MRB2031/F
AFCRL-68-0181
Contract AF 19 (628)-4348

Descriptors: (*Semiconductors, Organic materials), (*Photoconductivity, Organic materials), O-heterocyclic compounds, N-heterocyclic compounds, Purification, Photoconductivity, Carriers (Semiconductors), Doping, Fluorescence, Salicylates, Sodium compounds, Furans, Dyes, Chemical bonds, Photolysis, Anthracenes, Molecular energy levels, Spectroscopy.
Identifiers: *Organic semiconductors, *Organic photoconductors, Cyanine dyes, Oxazoles, Sodium salicylates, Tetraphenyl isobenzofurans.

The removal of naturally occurring impurities from oxazole scintillators reduced both the dark and photoconductivity. The addition of charge-transfer acceptors (e.g. chloranil) reduced the Ip/Id ratio in the host at concentrations as low as 0.00001 mole fraction. Impurities reduced both Ip/Id and solid state fluorescence values. Sodium salicylate and 1,3,4,7-tetraphenylisobenzofuran were also studied. The dark conductivities of the cyanine (photosensitizing) dyes showed a decrease in activation energy with increasing molecular conjugation. Flash photolysis was investigated as an analytical tool. Triplet state absorption in anthracene was absent when highly purified reagents were used. (Author)
AD-669 352 HC$3.00 MF$0.65

A MAGNETOREFLECTION STUDY OF ARSENIC AND BISMUTH.
Technical rept.,
Massachusetts Inst of Tech Cambridge Dept of Electrical Engineering
Martin Sidney Maltz. Jun 68, 283p Rept no. TR-7
Contract Nonr-1841 (72)
See also Technical rept. no. 4, AD-642 519.

Descriptors: (*Arsenic, Band theory of solids), (*Bismuth, Band theory of solids), Magnetic fields, Reflectivity, Brillouin zones, Single crystals, Cyclotron resonance phenomena, Perturbation theory, Theses.
Identifiers: Magnetoreflectance, Fermi surfaces.

The report describes studies of the band structure of the semimetals, arsenic and bismuth, using the magnetoreflection technique. In arsenic, two new series of oscillations in the magnetoreflectivity have been found. One series of oscillations, observed when the magnetic field is perpendicular

to the trigonal axis, seems to be associated with direct interband transitions between two bands with a critical point at T in the Brillouin zone. A second series of oscillations is observed when the magnetic field is parallel to the trigonal axis and is associated with direct interband transitions between two bands with a critical point along the Q axis in the Brillouin zone, using the symmetry notation of Lin and Falicov. Oscillations in the magnetoreflectivity were also observed for bismuth. These oscillations are associated with direct interband transitions between the valence and electronic conduction bands, which have a critical point at L in the Brillouin zone. The lineshape of the oscillations in the magnetoreflectivity were calculated, using the Lax model.
AD-669 439 HC$3.00 MF$0.65

TEMPERATURE DEPENDENCE OF F CENTER ABSORPTION IN KBr AND NaBr.

Technical rept.,
University of Western Ontario London Dept of Chemistry
Patrick W. M. Jacobs, and A. Krishna Menon. 20 May 68, 35p
Contract N00014-66-C-0142

Descriptors: (*Bromides, Color centers), (*Color centers, Absorption spectrum), Potassium compounds, Sodium compounds, Radiation damage, Thermal properties, Band spectrum, Ground state, Electrons, Phonons, Interactions, Canada.
Identifiers: Sodium bromide, Potassium bromide.

The absorption due to F centers in X-irradiated KBr and NaBr was measured over a wide range of temperatures from 4 to 370K. In NaBr (which is exceedingly difficult to colour) there is also formed a well isolated M band without the usual difficulty of overlapping R bands and so the temperature-dependence of the shape of this M band could also be determined accurately. The difficulty of the overlapping K band was dealt with in two ways: by Gaussian plots of the untreated data (after background subtraction) and by a computer resolution of the F and K bands. The latter calculations confirm the asymmetry of the K band. The half-widths of the F and M bands obey the usual formula for the variation of H with temperature and from the temperature-dependence of the half-widths, values of the effective ground state frequency were obtained. To what extent this represents a genuine local mode remains unresolved. There is some evidence for structure in the K band at low temperatures. (Author)
AD-669 494 HC$3.00 MF$0.65

LONGITUDINAL ULTRASONIC ATTENUATION OF PURE STRONG-COUPLING SUPERCONDUCTORS II,

Rutgers - the State Univ New Brunswick N J Dept of Physics
James W. F. Woo. 1968, 9p
Supported in part by NSF, and ONR.

Descriptors: (*Superconductors, Ultrasonic properties), Phonons, Electrons, Attenuation, Impurities, Interactions.
Identifiers: Ultrasonic attenuation.

Previous work on low frequency longitudinal ultrasonic attenuation in pure strong-coupling superconductors is extended to all values of ql (l = electron mean free path, q = phonon wave number). The result differs from that obtained for impurity scattering because vertex corrections are unimportant in the present problem. Numerical calculations of the reduced attenuation were performed for various values of q. (Author)
AD-669 498 HC$3.00 MF$0.65

A STUDY OF THE INTERACTIONS BETWEEN IONS IN SOLIDS.

Final rept. 1 Jul 64-31 Dec 67,
Chicago Univ Ill James Franck Inst
Donald S. McClure. May 68, 49p
Contract Nonr-2121 (28)

Descriptors: (*Crystal lattice defects, Interactions), Manganese compounds, Fluorides, Absorption spectrum, Alumina, Impurities, Vanadium, Calcium fluorides, Cerium, Atomic energy levels, Antiferromagnetism, Ions.
Identifiers: Manganese fluorides.

The final report includes a review of work accomplished, a list of publications, a list of all personnel, copies of two technical reports, namely 'Optical Spectra of Divalent Mn (++) Salts: II. The effect of Interionic Coupling on Absorption Strength,' by L. L. Lohr and D. S. McClure and 'The Electronic Absorption Spectrum of Ce (++) in CaF2 and the Energy Levels of the fd Configuration in a Cubic Field' by J. P. Brown and D. S. McClure. Also included is an abstract of a paper 'The Jahn-Teller Effect of V (+++) in Al2O3' by P. J. Stephens and M. Lowe-Pariseau. (Author)
AD-669 502 HC$3.00 MF$0.65

SPIN WAVE DISPERSION AND ENERGY BANDS IN fcc METALS.

Interim rept.,
Case-Western Reserve Univ Cleveland Ohio
Eric D. Thompson. May 68, 9p
AFOSR-68-0965
Grant AF-AFOSR-857-65
Availability: Published in International Journal of Quantum Chemistry, v1s p619-25 1967.

Descriptors: (*Ferromagnetic materials, Transport properties), Magnetic moments, Interactions, Band theory of solids, Brillouin zones, Fourier analysis, Nickel alloys, Copper alloys, Symmetry (Crystallography).
Identifiers: *Spin waves.

The spin wave dispersion along the principal axis directions from the center to the surface of the Brillouin zone is studied numerically for the fcc metals, the study being based on the 3d energy bands of nickel as calculated by Hanus. The dispersion dependence on the splitting between the up- and down-spin bands and on the magnitude of the interatomic exchange is given. Fourier analysis of the dispersion curves indicates that an effective exchange interaction is long range. It is also found that for sufficiently large interatomic exchange, the spin wave spectrum intersects the continuum of single particle excitations and that the single particle excitations will be thermally excited at temperatures well below the Curie point. Using experimental spin wave mass values for the nickel-copper alloys, the results of this dispersion calculation indicate that the splitting between the up- and down-spin bands decreases more rapidly with increasing copper than does the effective number of Bohr magnetons per atom. This implies that the effective band splitting interaction is alloy dependent. (Author)
AD-669 548 Not available from CFSTI.

A CENTER OF COMPETENCE IN SOLID STATE MATERIALS AND DEVICES,

Florida Univ Gainesville Coll of Engineering
Fred A. Lindholm, Arthur J. Brodersen, Eugene R. Chenette, Robert W. Gould, and Larry L. Hench. 10 Apr 68, 99p Rept no. Scientific-1
AFCRL-68-0185
Contract F19628-68-C-0058, ARPA Order-1060

Descriptors: (*Solid state physics, Reports), Ceramic materials, X-ray diffraction analysis, Electron microscopy, Transport properties, Carriers (Semiconductors), Semiconductor devices, Band theory of solids, Crystallization, Dislocations, Nuclear radiation, Noise (Radio), Integrated circuits, Silicon, Dielectrics.
Identifiers: Magnetic films, Semiconducting glasses, Junctions (Semiconductors), Computer simulation.

The report, for the first semiannual period of contract support, describes technical findings concerned with glass-ceramic dielectrics, semiconducting glasses, electronic and structural properties of semiconductors, near-degenerate pn junctions, and radiation studies on materials. In addition to the reporting of these technical findings, major additions to our experimental capability made during this period are summarized. Two detailed reportings are made concerning structure in glass-ceramic dielectrics: one concerning the kinetics of crystallization, studied by quantitative x-ray diffraction, and the other concerning structural changes resulting from thermal treatment, studied by electron microscopy, x-ray analysis, and dc and ac electrical properties. For semiconducting glasses, correlations are made concerning thermal treatment and structural changes, on the one hand, and dielectric and electronic properties, on the other. Results are reported from two studies aimed toward determining the structure of compound and elemental semiconductors. An expression for the diffusivity-mobility ratio is derived that is valid for degenerate as well as non-degenerate semiconductors, and is used to plot this ratio against carrier concentration. Brief disclosure is made concerning the radiation stability of semiconducting glasses and insulating glass-ceramics. (Author)
AD-669 580 HC$3.00 MF$0.65

HIGH FREQUENCY PARAMAGNETIC RESONANCE.

Final rept. 1 Apr 65-31 Mar 68,
Westinghouse Defense and Space Center Baltimore Md Aerospace Div
D. Mergerian. Apr 68, 16p
AFOSR-68-1002
Contract AF 49 (638)-1537

Descriptors: (*Crystal lattice defects, Paramagnetic resonance), (*Paramagnetic resonance, Spectrometers), Microwave spectroscopy, High frequency, Instrumentation, Ferromagnetic materials, Antiferromagnetism, Calcium fluorides, Rutile, Zinc compounds, Titanates, Impurities, Dysprosium, Manganese, Nickel, Hemoglobin.
Identifiers: Titanium dioxide, Zinc titanates.

The report describes a high frequency paramagnetic resonance spectrometer which was designed to operate at frequencies as high as 350 GHz, and its application to a number of specific material investigations. The spectrometer was designed and built during the initial year of this contract, and was applied initially in the study of CaF2 - Dy (2+). It was subsequently employed in studying the zero field split levels of TiO2 - Mn (3+), ZnWO4 - Ni (2+) and in attempts to observe and measure the zero field splitting of Fe (3+) in the hemoglobin molecule. This latter attempt has so far proven completely unsuccessful indicating that the splitting is considerably greater than 10/cm. Plans have also been formulated to utilize the spectrometer in studies of exchange and anisotropy effects in ferromagnetic, antiferromagnetic and ferrimagnetic materials where high frequency microwave studies may lead to a more complete understanding of these interactions. (Author)
AD-669 584 HC$3.00 MF$0.65

A STUDY OF EXCITON STATES IN ELECTRIC AND MAGNETIC FIELDS.

Memorandum rept.,
Frankford Arsenal Philadelphia Pa Pitman-Dunn Research Labs
Max E. Caspari, Michael A. Shields, and Issai Lefkowitz. Feb 68, 16p
FA-M68-25-1

Descriptors: (*Excitons, Interactions), Electric fields, Magnetic fields, Excitation, Single crystals, Transport properties, Stark effect, Zeeman effect, Band theory of solids, Carriers (Semiconductors), Perturbation theory, Hamiltonian.
Identifiers: Wannier exciton, Schrodinger equation.

The effect of static applied magnetic and electric fields on excitons is considered in terms of the Wannier exciton. Considering the fields as first order perturbations, the Hamiltonian for the system is derived. An experimental investigation of

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electrical and magnetic field effects on these exciton states is discussed. (Author)
AD-669 619 HC$3.00 MF$0.65

DELAYED COINCIDENCE-MOSSBAUER STUDIES OF SOLID STATE PHENOMENA.
Final rept. 1 Apr 66-30 Apr 68,
Boston Univ Mass
Gilbert R. Hoy. 17 May 68, 7p
AROD-6338:10-P
Grant DA-ARO (D)-31-124-G808

Descriptors: (*Mossbauer effect, Iron compounds), (*Ferroelectric crystals, Transition temperature), Crystal growth, Single crystals, Anisotropy, Electric fields, Magnetic fields, Cryogenics, Low-temperature research, Spinels, Chromium compounds, Sulfides, Sodium compounds.
Identifiers: Sodium nitroprusside, Ferrous chromium sulfide, Nitroprussides.

The research group has developed a suitable system for performing delayed-coincidence Mossbauer studies of solid state phenomena. The essential feature of effective electric field gradients and magnetic fields in ferrous compounds has been the development of techniques for obtaining the values of the effective fields at iron nuclei in solids from the corresponding Mossbauer spectrum. It was shown that a measurement of the discontinuity in the electric field gradient at the iron nuclei as a function of temperature is closely related to the ferroelectric transition. The effective field parameters at Fe57 nuclei in the cubic normal spinel $FeCr_2S_4$ have been investigated in the temperature range from 60 degrees K to 298 degrees K, using the Mossbauer effect. Single crystals of sodium nitroprusside were grown from solution and cut in various orientations with respect to the crystalline axes. (Author)
AD-669 631 HC$3.00 MF$0.65

MAGNETIZATION MEASUREMENTS AND PRESSURE DEPENDENCE OF THE CURIE POINT OF THE PHASE Sc3In.
California Univ San Diego La Jolla Dept of Physics
For primary bibliographic entry see Field 20C.
AD-669 641 Not available from CFSTI.

TEMPERATURE DEPENDENCE OF THE WIDTH OF THE FUNDAMENTAL LATTICE-VIBRATION ABSORPTION PEAK IN IONIC CRYSTALS. II. APPROXIMATE NUMERICAL RESULTS,
California Univ Irvine Dept of Physics
For primary bibliographic entry see Field 20B.
AD-669 642 Not available from CFSTI.

SURFACE SPIN WAVES,
California Univ Irvine Dept of Physics
For primary bibliographic entry see Field 20C.
AD-669 646 Not available from CFSTI.

ELECTRICAL RESISTIVITY OF DILUTE PdNi ALLOYS; LOCAL EXCHANGE ENHANCEMENT EFFECTS.
Scientific Interim rept.,
California Univ Irvine Dept of Physics
Pascal Lederer, and D. L. Mills. 4 Apr 68, 10p
AFOSR-68-0930
Grant AF-AFOSR-1080-66
Availability: Published in Physical Review, v165 n3 p837-44 Jan 68.

Descriptors: (*Palladium alloys, Resistance (Electrical)), (*Nickel alloys, Resistance (Electrical)), Band theory of solids, Electrons, Scattering, Magnetic properties, Molecular orbitals, Crystal lattice defects.

The contribution to the electrical resistivity of transition-metal alloys from scattering of s electrons from spin-density fluctuations in the d band is discussed. The resistivity is expressed in terms of the dynamic magnetic susceptibility of the alloy. A time-dependent molecular-field approximation is employed to obtain an approximate expression for the dynamic susceptibility, valid in the dilute limit, for host materials in which exchange-enhancement effects are important. If the isolated impurity center is almost magnetic, a large concentration-dependent contribution to the resistivity proportional to T sq. is found. The theory is shown to account for the recent measurements by Schindler and Rice of the temperature dependence of the electrical resistivity of dilute PdNi alloys. (Author)
AD-669 656 Not available from CFSTI.

RELATION BETWEEN PHOTOELASTICITY, ELECTROSTRICTION, AND FIRST-ORDER RAMAN EFFECT IN CRYSTALS OF THE DIAMOND STRUCTURE,
California Univ Irvine Dept of Physics
A. A. Maradudin, and E. Burstein. 4 Apr 68, 21p
AFOSR-68-0932
Grant AF-AFOSR-1080-66
Prepared in cooperation with Pennsylvania Univ., Philadelphia. Dept. of Physics.
Availability: Published in The Physical Review, v164 n3 p1081-99 Dec 15 1967.

Descriptors: (*Electrostriction, Semiconductors), (*Photoelasticity, Semiconductors), Diamonds, Silicon, Germanium, Phonons, Crystal lattices, Electric fields, Strain (Mechanics), Deformation.
Identifiers: Raman scattering, Elasto-optic effect, Lattice vibrations, Lattice dynamics.

A lattice theory of the elasto-optic and electrostriction constants of crystals of the diamond structure is presented. The results of the theory relate these constants to the derivatives of the electronic polarizability which determine the intensity of the first-order Raman scattering of light by such crystals. Experimental values of the elasto-optic constants are used to estimate the electronic polarizability derivatives for diamond, germanium, and silicon. (Author)
AD-669 663 Not available from CFSTI.

FUNDAMENTAL STUDIES OF THE METALLURGICAL, ELECTRICAL, AND OPTICAL PROPERTIES OF GALLIUM PHOSPHIDE QUARTERLY PROGRESS REPORT, 1 JAN. - 31 MAR. 1968.
Stanford Univ., Calif. Solid State Electronics Labs.
G. L. Pearson. 31 Mar 68, 17p NASA-CR-94308
Grant NSG-555

Descriptors: *Crystal optics, *Electrical properties, *Gallium phosphides, *P-n junctions, *Semiconductors (materials), *Temperature effects, Electrochemistry, Gaseous diffusion, High temperature research, Impurities, Junction diodes, Zinc.

For abstract, see STAR 06 12.
N68-22111 HC$3.00 MF$0.65

ELECTRONIC STRUCTURE OF CARBIDES AND NITRIDES OFACE-CENTERED CUBIC TRANSITION METALS OF THE NA CL TYPE.
Structure Electronique des Carbures Et des Nitrures de Metaux de Transition Cubiques Faces Centrees de Type Nacl
Office National D Etudes Et de Recherches Aerospatiales, Paris (France).
P. Costa. 1967, 100p ONERA-TP-540
Lang- in French Subm- Submitted for Publication

Descriptors: *Atomic structure, *Carbides, *Face centered cubic lattices, *Nitrides, *Transition metals, Band structure of solids, Electrical resistivity, Hall effect, Interstices, Magnetic permeability, Scandium, Sintering, Sodium chlorides, Specific heat, Superconductivity, Thermodynamic properties, Titanium, Vanadium, Yttrium.

For abstract, see STAR 06 12.
N68-22113 HC$3.00 MF$0.65

ROLE OF FOCUSING COLLISIONS IN THE PROCESS OF RADIATION ANNEALING OF POINT DEFECTS IN DIAMOND.
United Kingdom Atomic Energy Authority, Harwell (England).
I. V. Altovskii, V. I. Karpukhin, V. A. Nikolayenko, and P. A. Platonov. May 67, 14p NP-TR-1612, IAE-1091
Tran- Transl. Into English From Russian Rept. Iae-1091

Descriptors: *Annealing, *Diamonds, *Dynamic models, *Point defects, *Radiation effects, Crystal dislocations, Focusing, Ionic collisions, Single crystals.

For abstract, see STAR 06 12.
N68-22791 HC$3.00 MF$0.65

EXPERIMENTAL DETERMINATION OF PHONON LIFETIME IN CRYSTALS.
Determination Experimentale de La Duree de Vie des Phonons Dans les Cristaux
Commissariat A L Energie Atomique, Saclay (France).
M. Drifford. Dec 67, 15p CEA-BIB-100
Lang- in French, English Summary

Descriptors: *Crystal structure, *Half life, *Inelastic scattering, *Phonons, Brillouin effect, Neutrons, Photons, Radioactive decay, Raman spectra.

For abstract, see STAR 06 12.
N68-22878 HC$3.00 MF$0.65

EXPERIMENTAL STUDY OF SUPERCONDUCTIVITY INDUCED BY PROXIMITY EFFECTS.
Etude Experimentale de La Supraconductivite Indvite Par Effets de Proximite
Commissariat A L Energie Atomique, Saclay (France).
A. Martinet. Dec 67, 75p CEA-R-3757
Lang- in French

Descriptors: *Binary alloys, *Electron tunneling, *Superconductors, Bismuth alloys, Critical temperature, Indium alloys, Lead alloys, Proximity, Superconductivity, Thermodynamic coupling, Tin, Zinc.

For abstract, see STAR 06 12.
N68-22902 HC$3.00 MF$0.65

APPLICATION OF NEUTRON ACTIVATION ANALYSIS TO THE STUDY OF IMPURITIES IN MOLYBDENUM, TUNGSTEN AND NUCLEAR GRAPHITE.
Application de l'Analyse Par Activation Neutronique A l'Etude des Impuretes Dans le Molybdene, le Tungstene Et le Graphite Nucleaire
Commissariat A L Energie Atomique, Saclay (France).
G. Pinte. Oct 67, 79p CEA-R-3267
Lang- in French, English Summary

Descriptors: *Graphite, *Impurities, *Molybdenum, *Neutron activation analysis, *Tungsten, Qualitative analysis, Quantitative analysis, Spectrometers, Trace contaminants, Trace elements.

For abstract, see STAR 06 12.
N68-22997 HC$3.00 MF$0.65

CONTRIBUTION TO THE STUDY OF THE BEHAVIOUR OF SILICON PLANAR TRANSISTORS EXPOSED TO THE 60 CO GAMMA RAYS.
Contribution A l'Etude Du Comportement des Transistors Silicium A Structure Plane Soumis Aux Rayons Gamma Du 60co
Commissariat A L Energie Atomique, Saclay (France).

J. Le Ber. Dec 67, 63p CEA-R-3313
Lang- in French, English Summary

Descriptors: *Gamma rays, *Radiation effects, *Silicon transistors, Cobalt 60, Electrical properties, Monte carlo method, Reliability.

For abstract, see STAR 06 12.
N68-22999 HC$3.00 MF$0.65

THE USE OF A HIGH-FREQUENCY ELECTRODELESS PLASMATRON FOR THE PRODUCTION OF PURE SILICON AND SILICON OXIDES,
Tennessee Valley Authority, Oak Ridge. Wilson Dam, Ala.
For primary bibliographic entry see Field 7A.
PB-178 094T HC$3.00 MF$0.65

20M. Thermodynamics

EQUATIONS OF STATE IN SOLIDS.
Technical summary rept. no. 1 (Volume 1), 9 Dec 65-8 Dec 66,
Washington State Univ Pullman Shock Dynamics Lab
G. E. Duvall, G. R. Fowles, and Y. Horie. Feb 67, 132p Rept no. WSU-SDL-67-01
Contract DA-04-200-AMC-1702 (X)

Descriptors: (*Equations of state, Solids), (*Phase studies, Shock waves), Quartz, Liquids, Pressure, Kinetic theory, Strain (Mechanics), Elasticity, Approximation (Mathematics), Iron.

A procedure is described for developing simple approximate equations of state of liquids from Hugoniot P-V relations determined in shock wave measurements. This is applied to a number of liquids and a table of coefficients is given. The formalism of irreversible thermodynamics is applied to time-dependent phase transitions in iron and an approximate set of constitutive relations is obtained in a form suitable for numerical integration with the equations of continuum dynamics. These are applied in an approximate form to study the development of the two-wave structure in iron caused by the alpha-epsilon phase transition. Finite strain theory is applied to the analysis of shock wave data for quartz, and the results supply enough information to estimate some of the fourth-order elastic constants. (Author)
AD-669 251 HC$3.00 MF$0.65

INTERNAL LOW REYNOLDS NUMBER TURBULENT HEAT TRANSFER.
Arizona Univ Tucson Energy Mass and Momentum Transfer Lab
For primary bibliographic entry see Field 20D.
AD-669 254 HC$3.00 MF$0.65

CHARACTERISTICS OF THE DYNAMIC CALIBRATION OF AN INSTRUMENT FOR MEASURING THE INSTANTANEOUS TEMPERATURES OF GAS FLOWS (OSOBENNOSTI DINAMICHESKOI TARIROVKI APPARATURY DLYA IZMERENIYA MGNOVENNYKH TEMPERATUR GAZOVYKH POTOKOV),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 271 HC$3.00 MF$0.65

JOURNAL OF ENGINEERING PHYSICS, VOL. 9, NO. 2, 1965 (SELECTED ARTICLES),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 312 HC$3.00 MF$0.65

ENHANCEMENT OF HEAT AND MASS TRANSFER IN A STAGNATION REGION BY FREE STREAM VORTICITY,
Brown Univ Providence R I
For primary bibliographic entry see Field 20D.
AD-669 330 HC$3.00 MF$0.65

AN ANALYTICAL STUDY OF A FLUID CYLINDER ARC MODEL BALANCED BY CROSSED MAGNETIC AND FLOW FIELDS.
Ohio State Univ Columbus Dept of Mechanical Engineering
For primary bibliographic entry see Field 20I.
AD-669 354 HC$3.00 MF$0.65

GRAPHICAL METHODS IN AEROTHERMODYNAMICS,
Advisory Group for Aerospace Research and Development Paris (France)
For primary bibliographic entry see Field 20D.
AD-669 416 HC$3.00 MF$0.65

ANALYTICAL INVESTIGATION OF THE INFLUENCE OF VARIABILITY OF THERMOPHYSICAL PROPERTIES OF LIQUID WITH TURBULENT NONISOTHERMAL MOTION IN TUBES (ANALITICHESKOE ISSLEDOVANIE VLIYANIYA PEREMENNOSTI TEPLOFIZICHESKIKH SVOISTV ZHIDKOSTI PRI TURBULENTNOM NEIZOTERMIZESKOM DVIZHENII V TRUBAKII),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 418 HC$3.00 MF$0.65

AN ANALYSIS OF TRANSIENT CALORIMETRY,
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 14B.
AD-669 446 HC$3.00 MF$0.65

EFFECT ON HEAT EXCHANGE AND FRICTION OF COOLANT SUPPLY IN TURBULENT BOUNDARY LAYER (VLIYANIE NA TEPLOOBMEN I TRENIE PODACHI OKHLADITELEI V TURBULENTNYI POGRANICHNII SLOI),
Foreign Technology Div Wright-Patterson AFB Ohio
P. N. Romanenko, V. N. Kharchenko, and Yu. P. Semenov. 16 Jun 67, 38p Rept no. FTD-MT-66-109
Edited machine trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v9 n6 p816-33 1965.

Descriptors: (*Coolants, Heat transfer), (*Turbulent boundary layer, Cooling), Evaporation, Friction, Porous materials, Injection, Reynolds number, Air, Helium, Water, Carbon dioxide, Freons, Mass transfer, Acetones, Benzene, Butanols, USSR.
Identifiers: Transpiration cooling, Translations.

One of the most effective means for protecting walls from the effect of high temperature gases is transpiration cooling effected by injection of liquids or gases through the porous wall into the boundary layer. This subject is reviewed in the report which covers a total of 86 studies including 35 Soviet works. The following Soviet studies are included: Three theoretical studies by Motulevich, in which transpiration cooling is analyzed and the integration of the boundary layer equations is attempted. Kutateladze presented analyses, made with the assumption that the sublayer is destroyed and that boundary layer conditions are similar to those at an infinite Reynolds number. These studies yielded relationships for the friction and heat transfer coefficients as a function of the intensity of the coolant injection. Romanenko studied the injection of air, helium, carbon dioxide, and freon-10 into a subsonic turbulent boundary layer on a porous copper plate experimentally. Mugalev's studies with the injection of air and other gases through a porous plate into a sub- or supersonic air stream included methods for calculating the heat and mass transfer. Sergeev studied the intensification of heat transfer by use of coolants, such as water, acetone, benzene, and butanol, which evaporate. Equations for calculating the heat and mass transfer during the evaporation of liquids from porous ceramic plates were derived. Isachenko studied cooling by injecting water through a porous copper plate, and Fedorov measured velocity and temperature fields when water is injected through a porous ceramic plate. (Author)
AD-669 527 HC$3.00 MF$0.65

TEMPERATURE DEPENDENCE OF THE CALORIC RADIOMETER AND ITS COMPENSATION.
Technical rept.,
Army Electronics Command Fort Monmouth N J
Reinhold M. Marchgraber. Jan 68, 23p Rept no. ECOM-2933

Descriptors: (*Radiometers, Errors), Calorimetry, Conduction (Heat transfer), Energy, Thermal radiation, Heat flux, Flow charting, Calibration, Design, Modification kits, Sensitivity, Statics, Transients, Mathematical analysis, Thermocouples, Networks, Resistance (Electrical), Approximation (Mathematics), Corrections.
Identifiers: *Caloric radiometers, Compensation (Temperature).

Radiometers of the caloric type show a dependence of their calibration, which is partly transient and partly static, upon the temperature of their environment. The static dependence, entering as error in continuous integration of radiant fluxes, is discussed and techniques for eliminating this dependence by proper design and/or compensation are described. (Author)
AD-669 593 HC$3.00 MF$0.65

SURFACE RECOMBINATION EFFICIENCIES IN FLOWS CONTAINING STEP-FUNCTION INCREASES IN ATOMIC OXYGEN.
Cornell Aeronautical Lab Inc Buffalo N Y
For primary bibliographic entry see Field 7D.
AD-669 655 HC$3.00 MF$0.65

NATURAL CONVECTION FROM HORIZONTAL RECTANGULAR CYLINDERS OF VARIOUS ASPECT RATIOS.
Technical rept.,
Catholic Univ of America Washington D C Dept of Mechanical Engineering
Mahn Hee Hahn, and David A. Didion. 15 May 68, 27p Rept no. TR-3
Contract Nonr-2249 (12)

Descriptors: (*Convection (Heat transfer), Cylindrical bodies), Rectangular bodies, Heat transfer coefficients, Aspect ratio, Laminar flow, Two-dimensional flow, Prandtl number, Flat plate models.
Identifiers: Grashof number.

An experimental investigation was conducted to determine the convective heat transfer coefficients for rectangular cylinders with various aspect ratios in air under atmospheric conditions. An empirical formula showing the correlation of the heat transfer coefficient with aspect ratio (height/half-perimeter) is obtained from the experimental data. Four models having the same perimeter were tested with aspect ratios varying from 1 : 8 to 7 : 8. The agreement between the empirical equation and experimental result for all the cases tested is within 5%. (Author)
AD-669 694 HC$3.00 MF$0.65

FLOW FIELD COMPUTATIONS FOR BLUNT BODIES IN PLANETARY ENVIRONMENTS (EQUILIBRIUM) FINAL REPORT.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Missile and Space Div.
For primary bibliographic entry ee Field 1A.
For abstract, see STAR 06 12.
N68-21858 HC$3.00 MF$0.65

Group 20M—Thermodynamics

THE STATISTICAL THEORY OF THERMAL CONVECTION AT LARGE PRANDTL NUMBER.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
J. R. Herring. Apr 68, 77p NASA-TM-X-63171, X-641-68-141

Descriptors: *Free convection, *Mathematical models, *Prandtl number, Free boundaries, Graphs (charts), Isotropic turbulence, Nonlinearity, Nusselt number, Rayleigh number, Statistics, Turbulent flow.

For abstract, see STAR 06 12.
N68-21894 HC$3.00 MF$0.65

EFFECTS OF SHOCK IMPINGEMENT AND OTHER FACTORS ON LEADING-EDGE HEAT TRANSFER.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
D. M. Bushnell. Apr 68, 17p NASA-TN-D-4543, NASA-SP-148
Contract 126-13-03-31-23
Refs Conf- Presented At the Conf. on Hypersonic Aircraft Technol., Moffett Field, Calif., 16-18 May 1967 Subm- Submitted for Publication

Descriptors: *Flow distribution, *Heat transfer, *Leading edges, Boundary layers, Flat plates, Grooves, Hypersonic flow, Impingement, Sweepback.

For abstract, see STAR 06 12.
N68-22118 HC$3.00 MF$0.65

HEAT CONDUCTIVITY OF GRANULAR SYSTEMS.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
G. N. Dulniev, and Z. V. Sigalova. 29 Feb 68, 22p NASA-TM-X-61060, RSIC-755
Tran- Transl. Into English From Inzh.-fiz. Zh. (Moscow), V. 7, No. 10, 1964 P 49-55 Prep- Prepared in Cooperation With Redstone Sci. Information Center.

Descriptors: *Gas flow, *Granular materials, *Heat transfer, *Mathematical models, *Thermal conductivity, Gas pressure, Pellets, Porosity, Thermal diffusion.

For abstract, see STAR 06 12.
N68-22195 HC$3.00 MF$0.65

HYPERVELOCITY HEAT TRANSFER STUDIES IN SIMULATED PLANETARY ATMOSPHERES FINAL REPORT.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Sciences Lab.
For primary bibliographic entry see Field 22A.
For abstract, see STAR 06 12.
N68-22230 HC$3.00 MF$0.65

RADIATION HEAT TRANSFER IN ABSORBING, SCATTERING, AND EMITTING MEDIUM.
Tennessee Univ., Tullahoma. Space Inst.
F. Shakrokhi, and P. Wolf. Apr 68, 22p NASA-CR-1023
Contract NGR-43-001-021
Coll- 22 P Refs

Descriptors: *Anisotropic media, *Iterative solution, *Radiative heat transfer, Electromagnetic scattering, Emittance, Finite difference theory, Parallel plates, Radiation absorption.

For abstract, see STAR 06 12.
N68-22318 HC$3.00 MF$0.65

STUDY OF THERMOCOUPLES FOR MEASUREMENT OF HIGH TEMPERATURES.
Etude de Thermocouples pour le Reperage des Hautes Temperatures
Techtran Corp., Glen Burnie, Md.
M. Villamayor. Apr 68, 84p NASA-TT-F-11623
Contract NASW-1695
Coll- 84 P Refs Tran- Transl. Into English of Cear-3182 Rept.

Descriptors: *Flux density, *Performance tests, *Rhenium alloys, *Thermal neutrons, *Thermocouple pyrometers, *Tungsten alloys, High temperature research, Measuring instruments, Nuclear reactors.

For abstract, see STAR 06 12.
N68-22383 HC$3.00 MF$0.65

COATING SELECTION PROGRAM - THEORY.
General Electric Co., Philadelphia, Pa.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 06 12.
N68-22391 HC$3.00 MF$0.65

FORMULATION OF A METHOD FOR PREDICTING COUPLED CONVECTIVE AND RADIATIVE HEAT TRANSFER ABOUT A BLUNT BODY.
Lockheed Missiles and Space Co., Huntsville, Ala.
C. D. Engel, and L. W. Spradley. Apr 68, 51p NASA-CR-61200
Contract NAS8-20082

Descriptors: *Blunt bodies, *Convective heat transfer, *Mathematical models, *Radiative heat transfer, Hypersonic flow, Hypersonic reentry, Shock layers, Spacecraft reentry, Thermodynamic equilibrium.

For abstract, see STAR 06 12.
N68-22403 HC$3.00 MF$0.65

EMITTANCE OF ABLATIVE MATERIALS FINAL REPORT.
TRW Systems, Redondo Beach, Calif.
For primary bibliographic entry see Field 21H.
For abstract, see STAR 06 12.
N68-22415 HC$3.00 MF$0.65

SOLAR HEATING OF VARIOUS SURFACES.
Building Materials and Structures rept.,
National Bureau of Standards, Washington, D. C.
Herman V. Cottony, and Richard S. Dill. 23 Jan 41, 12p BMS-64

Descriptors: (*Finishes + finishing, *Thermal radiation), Roofs, Paints, Solar radiation, Solar collectors, Temperature control, Test methods, Thermal properties, Surface temperatures.
Identifiers: Protective coatings.

Methods of improving comfort conditions in homes during warm weather were investigated in connection with the low-cost housing program at the National Bureau of Standards, and this report presents one phase of this subject. During this study, the temperatures attained by various surfaces exposed to the sun and weather, as if upon a roof, were observed. Heating by sunlight and cooling by radiation to the sky at night of several paints and commonly used roof coverings can be compared directly by means of the results obtained.
PB-177 986 HC$3.00 MF$0.65

THERMAL RESISTANCE OF AIRSPACES AND FIBROUS INSULATIONS BOUNDED BY REFLECTIVE SURFACES.
Building Materials and Structures rept.,
National Bureau of Standards, Washington, D. C.
H. E. Robinson, L. A. Cosgrove, and F. J. Powell. 14 Nov 57, 28p BMS-151

Descriptors: (*Construction materials, *Thermal insulation), Buildings, Heat-resistant materials, Thermal properties, Fibers, Foils, Aluminum, Test methods, Graphics.

Observed insulating values are presented for 28 test panels, of which 23 were insulated with reflective membranes used alone or in combination with fibrous insulations. The panels were tested at five different orientations corresponding to use as walls, ceilings, or floors. The observed insulating values of panels are compared with calculated values based on a method and data developed in previous work at the National Bureau of Standards, and summarized in an appendix to this report. Observed values for panels agreed within 10 percent, in most cases, with calculated values. Departures of observed from calculated values are attributed to such factors as nonuniformity of airspace thickness, moisture condensation on reflective surfaces, air circulation between tandem airspaces, and effects due to local high conductance at edges of insulations or radiation from framing members.
PB-177 987 HC$3.00 MF$0.65

A STATE OF THE ARTS SURVEY AND A STUDY OF THE FEASIBILITY OF RESEARCH IN THE AREA OF NEEDLE HEATING DURING HIGH SPEED SEWING.
North Carolina State Univ., Raleigh. Dept. of Textile Technology.
For primary bibliographic entry see Field 11E.
PB-178 195 HC$3.00 MF$0.65

20N. Wave Propagation

FLUSH-MOUNTED PRESSURE TRANSDUCER SYSTEMS AS SPATIAL AND SPECTRAL FILTERS.
Naval Ship Research and Development Center Washington D C Acoustics and Vibration Lab
For primary bibliographic entry see Field 14B.
AD-669 202 Not available from CFSTI.

DOPPLER EFFECT CORRECTION FOR MOTIONS OF SOURCE, OBSERVER, AND FLUID.
Technical note,
Boeing Co Renton Wash Airplane Div
R. A. Mangiarotty. 21 Nov 66, 24p Rept no. D6-17095-TN

Descriptors: (*Doppler effect, Corrections), Bandwidth, Motion, Frequency shift, Wave transmission, Numerical methods and procedures, Power spectra.

Pertinent equations for the Doppler effect are presented for the general case of moving sources and receivers in a moving medium. A method is also given for correcting the spectral energy level of data measured in bandwidths. (Author)
AD-669 222 HC$3.00 MF$0.65

CHANNEL SIMULATION-DIGITAL VS. ANALOG.
Technical rept.,
Institute for Telecommunication Sciences Boulder Colo
E. A. Quincy. Mar 68, 54p Rept no. ITS-60 ERL-70
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C. 20402 $0.25.

Descriptors: (*Information theory, Multipath transmission), (*Multipath transmission, Simulation), Integral transforms, Transfer functions, Analog-digital computers, Digital computers, Real time, Costs, High frequency.
Identifiers: Tropospheric scatter communication, Computer simulation, Cost analysis.

A comparison is made of digital computers and specially constructed analog (hybrid) devices for simulation of random, time-variant, time- and frequency-dispersive channels. The comparison is made primarily on an economic basis; however, emphasis is also given to the computer speed required for real-time digital simulation. A physically oriented channel model is presented. A cost analysis is presented. Typical troposcatter (1 MHz BW and 1 microsec. dispersion) and HF (3 kHz BW

and 1.5 ms dispersion) channels are considered as specific examples. Present-day general purpose digital computers and the fastest signal processors available are shown to require approximately the same amount of computing time for simulation. Neither is capable of real-time simulation of either an HF or troposcatter channel. (Author)
AD-669 283 MF$0.65

RADIATION OF A HERTZ DIPOLE MOVING AROUND A CONDUCTING SPHERE.
Technical rept.,
California Inst of Tech Pasadena Antenna Lab
John Lam. Mar 68, 41p Rept no. TR-43
Grant AF-AFOSR-1400-68

Descriptors: (*Antenna radiation patterns, Satellites (Artificial)), (*Electromagnetic waves, Spheres), Dipole moments, Electromagnetic wave reflections, Doppler effect, Scattering, Fourier analysis, Conformal mapping, Hypergeometric functions, Series, Convergence, Circular orbit trajectories.
Identifiers: Maxwells equations, Hertz dipoles.

An exact expression is obtained for the field of a horizontal Hertz dipole moving around a conducting sphere in a circular orbit. This expression is in the form of a double series which, in the case of a large sphere, is evaluated by the method of Watson transformation. The geometrical optics field is separated out and its properties examined. It is found that the incident and reflected waves are of different frequencies. (Author)
AD-669 370 HC$3.00 MF$0.65

A GEOMETRICAL THEORY OF DIFFRACTION ANALYSIS OF THE RADAR CROSS SECTION OF A SECTIONALLY CONTINUOUS SECOND-DEGREE SURFACE OF REVOLUTION.
Ohio State Univ Columbus Electroscience Lab
For primary bibliographic entry see Field 17I.
AD-669 372 HC$3.00 MF$0.65

RADIO PROPAGATION OVER THE SEA IN THE 2-TO-10-MHZ RANGE.
Research rept. Jul 66-Jan 67,
Naval Electronics Lab Center for Command Control and Communications San Diego Calif
C. H. Freres, D. B. Sailors, and . L. Taylor. 21 Nov 67, 63p Rept no. NELC-1526

Descriptors: (*Radio transmission, *Ionospheric propagation), Oceans, Mathematical models, Radio waves, Propagation, Atmospherics, Ionospheric propagation, Computers, Microwaves, Polarization, Radiofrequency interference, Periodic variations.
Identifiers: Ground waves, Sky waves, Computer analysis, Winter (Season), F layer.

Computer model studies reveal effects of sky wave and noise on the ground wave. Sky-wave interference is greater for low sunspot number, for low F-layer height, and in winter. For 1-kW radiated power at night, the sky-wave field strength of the one-hop F2 mode at 3 MHz is equal to the ground-wave field strength at a range of 340 km. When vertically polarized antennas with a sq cos delta pattern are used, the ground-wave signal strength is 20 dB above the sky-wave signal strength at a range of 340 km. The detectability of signals within the 2-to-10-MHz band at long range by sky-wave modes is also given. (Author)
AD-669 442 HC$3.00 MF$0.65

TRANSMISSION LOSSES IN A FOREST FOR ANTENNAS CLOSE TO HE ROUND,
Army Electronics Command Fort Monmouth N J
David F. Dence, and Theodor Tamir. Feb 68, 40p Rept no. ECOM-2940
ARPA Order-371

Descriptors: (*Radio transmission, Trees), Attenuation, High frequency, Very high frequency, Polarization, Antennas, Admittance, Numerical analysis, Propagation, Mathematical models.

During the last few years, measurements have been made to determine the electrical characteristics and the predominant mode of propagation in a forest environment. This work was essential because of the severe attenuation of radio communication signals which occur when operating in a forest medium. Theoretical investigations have shown that for distances greater than 1 km and for frequencies between 2 and 200 MHz the forest can be represented to a first approximation as a conductive slab bounded on one side by air and on the other side by the earth. Using this conductive slab as a model, the transmission losses between two elementary dipoles located close to the ground in a forest were calculated for both horizontal and vertical polarization. Those parameters which would affect the transmission losses are examined and then the sensitivity of the respective parameters is evaluated in detail. It turns out that the change in input resistance caused by the ground proximity produces a loss which may be considerably larger than the other losses. Various data are presented which show the theoretical transmission losses vs frequency for different parameters which include the height of the antenna above ground, the height of the forest, and the electrical characteristics of the ground and the forest. (Author)
AD-669 608 HC$3.00 MF$0.65

TRANSVERSE WAVE INTERACTIONS BETWEEN ROTATING ELECTRON BEAMS AND WAVE GUIDES.
Utah Univ Salt Lake City Microwave Device ·.d Physical Electronics Lab
For primary bibliographic entry ee Field 0C.
AD-669 625 HC$3.00 MF$0.65

SEMIANNUAL PROGRESS REPORT NO. 75, COVERING PERIOD JULY 1, 1967 - DECEMBER 31, 1967.
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
Apr 68, 86p
Contract N00014-67-A-0298
See also AD-664 239.

Descriptors: (*Army research, Reports), Reports, Electromagnetic waves, Electrons, Solid tate physics, Crystallography, Spectroscopy, Automatic, Control systems, Programming languages, Input-output devices, Communication equipment, Ferroelectric materials, Plasma medium, Antennas, Information theory.
Identifiers: Graphs (Charts).

Materials are presented in fields relating to electromagnetic waves, electronics, and automation.
AD-669 693 HC$3.00 MF$0.65

TECHNIQUE FOR RADIATING AN ISOLATED PULSE OF ELECTROMAGNETIC FIELD.
Technical rept.,
EG and G, Inc., Boston, Mass. Eastern Science and Technology Div.
C. S. Fitzgerald. 27 Dec 67, 58p Rept. no. B-3719
Contract AT (29-1)-1183

Descriptors: (*Electromagnetic pulses, Production), Electromagnetic fields, Measurement, Dipole moments, Bandwidth, Response, Calibration, Theses.

For abstract, see NSA 22 10.
EGG-1183-428 HC$3.00 MF$0.65

STABILITY OF THE NEW RADIO FLASH CODE,
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 12A.
For abstract, see NSA 22 10.
LA-3864 HC$3.00 MF$0.65

ON THE SOLUTION OF THE INTEGRAL EQUATION RELATING HEIGHT DISTRIBUTION OF ELECTRON DENSITY TO RADIO WAVE ABSORPTION.
Kiruna Geophysical Observatory (Sweden).
B. Hultquist. Aug 67, 18p KGO-673

Descriptors: *Absorptivity, *Electromagnetic absorption, *Integral equations, *Radio waves, Electron density profiles, Height, Ionospheric propagation, Magnetoionics, Polynomials.

For abstract, see STAR 06 12.
N68-21846 HC$3.00 MF$0.65

VLF SIGNAL PHASE INSTABILITIES PRODUCED BY PROPAGATION MEDIUM - EXPERIMENTAL RESULTS.
Kiruna Geophysical Observatory (Sweden).
F. H. Reder, and S. Westerlund. 22 Dec 67, 73p KGO-676
Conf- Presented At the Proc. of Agard-ewp on Phase and Frequency Instability in Radio Wave Propagation, Ankara, 9-12 Oct. 1967

Descriptors: *Ionospheric disturbances, *Ionospheric propagation, *Radio receivers, *Radio signals, *Radio transmitters, *Radio waves, Diurnal variations, Propagation modes, Very low frequencies.

For abstract, see STAR 06 12.
N68-21847 HC$3.00 MF$0.65

FARADAY ROTATION OBSERVATIONS USING A ROTATING ANTENNA.
Kiruna Geophysical Observatory (Sweden).
L. Liszka, and A. Wernik. Dec 67, 7p KGO-678

Descriptors: *Antennas, *Faraday effect, *Polarization (waves), Mathematical models, Rotation, Signal measurement.

For abstract, see STAR 06 12.
N68-22117 HC$3.00 MF$0.65

SCATTERING OF LIGHT IN A TURBID MEDIUM.
Scientific Translation Service, La Canada, Calif.
For primary bibliographic entry see Field 4A.
For abstract, see STAR 06 12.
N68-22462 HC$3.00

21. PROPULSION AND FUELS

21B. Combustion and Ignition

INVESTIGATION OF DIFFUSION FLAMES (ISSLEDOVANIE DIFFUZIONNYKH PLAMEN),
Foreign Technology Div Wright-Patterson AFB Ohio
Sh. A. Ershin, and L. P. Yarin. 15 Sep 67, 42p Rept no. FTD-MT-24-165-67
Edited machine trans. of Problemy Teploenergetiki i Prikladnoi Teplofiziki (USSR) n1 p101-39 1964.

Descriptors: (*Exhaust flames, Diffusion), Supersonic combustion, Jets, Laminar flow, Turbulence, Boundary layer, Subsonic characteristics, Supersonic characteristics, Axially symmetric flow, Velocity, Momentum, Wake, USSR.
Identifiers: Translations.

The paper discusses the results of comprehensive theoretical and experimental studies of diffuse combustion in laminar and turbulent gas currents (jets). The study covered: (1) the combustion of unmixed gases within laminar plane-parallel boundary layers; (2) the combustion within plane-parallel boundary layers in the sub- and supersonic effluent velocity regions; (3) the combustion of axially-symmetrical and plane gas flames with given initial velocity (momentum), temperature, and concentration distributions; and (4) the com-

bustion of axially symmetrical turbulent flames of finite dimensions spreading within a wake homogeneous current. The results confirmed the basic assumptions of the aerodynamic theory of gas flames, and the methods of the flow theory applied to the calculation of gas combustion allow the development of efficient approaches to the aerodynamic design of gas torches. The article also offers numerical results in the form of graphs and tables which may be utilized during engineering designs. (Author)
AD-669 306 HC$3.00 MF$0.65

PROCESSES OF BURNING AND HEAT EXCHANGE DURING BURNING OF LIQUID FUEL UNDER HIGH PRESSURE (PROTSESSY GORENIYA I TEPLOOBMENA PRI SZHIGANII TOPLIVA POD VYSOKIM DAVLENIEM),
Foreign Technology Div Wright-Patterson AFB Ohio
V. M. Ivanov, and Z. I. Frenkina. 18 Aug 67, 26p Rept no. FTD-MT-24-133-67
Edited machine trans. of Akademiya Nauk SSSR. Institut Goryuchikh Iskopaemykh. Trudy, n23 p146-61 1965.

Descriptors: (*Fuel oils, Combustion), (*Combustion, High-pressure research), Burning rate, Heat transfer, Oxidizers, Air, Oxygen, Combustion chambers, Fuel consumption, Fluid dynamic properties, USSR.
Identifiers: Translations.

As a part of the program of comprehensive studies of combustion and heat transfer at high pressures, an experimental investigation was made of diesel fuel combustion under 8 atm of air and up to 50 atm of oxygen-steam. The experiments were conducted in two combustion chambers with diameters of 0.22 and 0.32 and lengths of 1.65 and 2 m. The length of combustion zone was determined as a function of the air excess factor and pressure. A previously derived formula for calculating the length of the combustion zone as a function of the air excess factor, flow velocity, and fuel density was found to give results in good agreement with the experiments. Temperature, velocity, and concentration profiles and heat transfer coefficients were also obtained. (Author)
AD-669 307 HC$3.00 MF$0.65

INVESTIGATION OF MATERIALS COMBUSTIBILITY, FIRE, AND EXPLOSION SUPPRESSION IN A VARIETY OF ATMOSPHERES.
Final rept. 15 Nov 64-30 Dec 67,
Dynamic Science Corp Monrovia Calif
M. R. Stevens, H. D. Fisher, and B. P. Breen.
May 68, 103p* Rept no. SN-64
AFAPL-TR-68-35
Contract AF 33 (615)-2257

Descriptors: (*Controlled atmospheres, Fires), (*Spacecraft cabins, Fires), (*Organic materials, Ignition), (*Explosions, Inhibition), Simulation, Atmosphere, Flammability, Flame propagation, Fire extinguishers, Space environmental conditions, Autoignition, Model tests, Burning rate, Test equipment, Test methods, Fire safety, Oxygen, Pressurization, Vacuum, Tables.
Identifiers: Halon 1301 flame extinguishant.

Combustibility studies of materials of construction employed in space flight vehicle cabins have been carried out as a function of various simulated cabin atmospheric environments. The program was conducted under three distinct phases. Phase 1 efforts were directed at defining the spontaneous ignition temperature, of the individual materials, under dynamic atmospheric conditions for the various atmospheres employed. Phase 2 centered about the burning characteristics of the respective materials as a function of atmospheric and gravitational environments. These studies also involve the effects of various extinguishants upon the burning characteristics under the influence of several atmospheric environments and gravitational variations. Phase 3 focused upon the flame spread behavior of the material, under the influence of various atmospheric environments and in the presence of Halon 1301 flame extinguishant. Detailed analyses of the work clearly show the dependency of the combustion behavior of the materials upon the atmospheric environment utilized. (Author)
AD-669 349 HC$3.00 MF$0.65

EXPERIMENTAL BURNING RATES AND COMBUSTION MECHANISMS OF SINGLE BERYLLIUM PARTICLES,
Purdue Univ Lafayette Ind Project Squid Headquarters
Andrej Macek, and J. McKenzie Semple. Mar 68, 28p Rept no. SQUID-TR-ARC-11-PU
Contract N00014-67-A-0226

Descriptors: (*Beryllium, *Combustion), Solid rocket propellants, Additives, Powder metals, Ignition, Burning rate, Flames, Vapors, Oxidizers, Oxygen, Beryllium oxides.
Identifiers: Squid project.

Single spherical beryllium particles from two powder samples having average particle diameters of 32 microns and 25 microns respectively were injected into oxidizing gases, both moist and dry, at atmospheric pressure and at temperatures ranging from 2600 to 2950K. The purpose was accurate measurement of metal burning rates and a study of parameters affecting these rates. Ignition efficiencies, burning rates, and flame diameters of particles were found to vary both with particle diameters and with ambient gas properties. It is concluded that beryllium particles may burn by several distinct modes. One is rapid vapor-phase diffusion flame, favored by high partial pressures of oxygen and high temperatures of the gaseous environment. The burning times corresponding to this mode, measured with accuracy of plus or minus 0.1 msec and ranging from 1.3 to 4.5 msec. were found to be proportional to the square of the particle diameter and inversely proportional to a power of oxygen pressure slightly less than unity. As the partial pressure of oxygen is decreased below a certain value which is usually between 0.1 and 0.2 atm, the metal flame temperature decreases and vapor-phase combustion gradually changes over into slow surface reaction. There is also evidence of a third mode in which combustion is only moderately slower than the rapid vapor-phase burning. This mode, favored by low temperature and by the presence of water vapor in the environment, may be vapor-phase combustion hindered by a heavy coating of beryllia accumulated on the particle during the pre-ignition surface reaction. (Author)
AD-669 489 HC$3.00 MF$0.65

VARIOUS STUDIES OF JET FLAMEHOLDERS.
Final rept.,
Tulane Univ New Orleans La Dept of Mechanical Engineering
J. R. O'Loughlin. Jun 68, 19p
AROD-4981:7-E
Contract DA-31-124-ARO (D)-240

Descriptors: (*Flame holders, Jet flames), (*Jet flames, Stabilization), Design, Combustion chambers, Efficiency, Thermodynamics, Aerodynamic characteristics, Chlorine, Additives, Inhibition, Secondary flow.

The overall objective of the research was to obtain a better understanding of the characteristics of jet flameholders. Both experimental and analytical studies were conducted in order to achieve this end. The overall objective was subdivided into two research areas as follows: (1) Studies of the mechanism of flame stabilization. (2) Studies of the flame downstream of the flame stabilization region. (Author)
AD-669 634 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATIONS OF LIQUID PROPELLANT COMBUSTION PROCESSES USING STREAK PHOTOGRAPHY.
Princeton Univ., N. J. Dept. of Aerospace and Mechanical Sciences.
R. M. Williams, Jr.. Feb 68, 62p NASA-CR-72371, AMS-TR-800
Contract NASR-217

Descriptors: *Combustion chambers, *Combustion stability, *Liquid rocket propellants, *Photomicrography, Cold flow tests, Drops (liquids), Flame propagation, Injectors, Jet flow, Liquid propellant rocket engines, Orifices.

For abstract, see STAR 06 12.
N68-21915 HC$3.00 MF$0.65

COMPUTER SIMULATION OF HIGH FREQUENCY COMBUSTION INSTABILITY AND ITS SUPPRESSION FINAL REPORT.
Pratt and Whitney Aircraft, West Palm Beach, Fla. Research and Development Center.
R. E. Bucher. 30 Apr 68, 158p NASA-CR-94304, PWA-FR-2634
Contract NASW-1512

Descriptors: *Combustion stability, *Computerized simulation, *Liquid propellant rocket engines, Combustion chambers, Gas dynamics, Gas flow, High frequencies, Inviscid flow, Sound transmission.

For abstract, see STAR 06 12.
N68-22095 HC$3.00

INVESTIGATIONS IN CHEMICAL ROCKET PROPULSION FINAL REPORT, 1 JUL. 1964 - 31 DEC. 1967.
Purdue Univ., Lafayette, Ind. Jet Propulsion Center.
For primary bibliographic entry see Field 21H.
For abstract, see STAR 06 12.
N68-22683 HC$3.00 MF$0.65

OPEN FIRES. VOLUME I.
Final rept. on volume 1,
Instituto Nacional de Tecnica Aeroespacial, Madrid (Spain).
Pedro Perez del Notario. May 67, 91p*
Grants FG-SP-114, FG-SP-146
See also Volume 2, PB-178 194.

Descriptors: (*Fuels, *Flammability), Thermal properties, Temperature, Heat of combustion, Burning rate, Radiometers, Thermocouples, Equations of state, Containers.
Identifiers: Graphs (Charts).

The research program has comprised the experimental and theoretical study of some basic laws of open fires. This study has been carried out by utilizing the pool fire technique, which consists in burning liquid fuels in cylindrical vessels, and in measuring and analyzing burning rates, energy balances, flame properties and fuel temperatures. Several important conclusions have been obtained on burning rates, energy balances and flame characteristics including the influence of type of fuel, vessel size and vessel configuration.
PB-178 193 HC$3.00 MF$0.65

TRANSPORT AND COMBUSTION OF FIREBANDS. VOLUME II.
Instituto Nacional de Tecnica Aeroespacial, Madrid (Spain).
For primary bibliographic entry see Field 2F.
PB-178 194 HC$3.00 MF$0.65

21C. Electric Propulsion

EXPLORATORY ELECTROMAGNETIC THRUSTER RESEARCH ANNUAL REPORT.
Giannini Scientific Corp., Santa Ana, Calif.
A. C. Ducati, R. G. Jahn, E. Muehlberger, and R. P. Treat. Feb 68, 75p NASA-CR-62047, TR-117-1513
Contract NASW-1513

Descriptors: *Electric arcs, *Thrust measurement, *Vacuum apparatus, Aerospace environments, Cathodes, Electric propulsion, Environment simulation, Environmental tests, Glass fibers, Magnetic fields, Plasma jets, Research facilities.

For abstract, see STAR 06 12.
N68-21901 HC$3.00 MF$0.65

SOME ASPECTS OF ADVANCED PROPULSION SYSTEMS APPLICATIONS.
European Space Vehicle Launcher Development Organization, Paris (France). Studies and Exptl. Work Directorate.
For primary bibliographic entry see Field 22D.
For abstract, see STAR 06 12.
N68-21907 HC$3.00 MF$0.65

ION ENGINE THRUST VECTOR STUDY.
Hughes Research Labs., Malibu, Calif. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
K. Amboss, G. R. Brewer, S. Kami, H. King, and G. Nudd. Apr 68, 69p NASA-CR-94250, QR-1
Contracts NAS7-100, JPL-952129
Prep- Prepared for Jpl

Descriptors: *Ion engines, *Misalignment, *Thrust vector control, Analog computers, Digital computers, Electrodes, Particle trajectories, Perturbation, Thermal stresses.

For abstract, see STAR 06 12.
N68-21944 HC$3.00 MF$0.65

COMPOSITE ION ACCELERATOR GRIDS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
B. Banks. 1968, 24p NASA-TM-X-52425
Refs Conf- Presented At the 3d Intern. Conf. on Electron and Ion Beam Sci. and Tech., Electrochem. Soc. of Boston, 6-9 May 1968

Descriptors: *Electrostatic propulsion, *Ion extraction, *Mercury (metal), *Rocket engines, Electron impact, Fabrication, Glass, Grids, Ion beams, Low thrust propulsion.

For abstract, see STAR 06 12.
N68-22364 HC$3.00 MF$0.65

AN EXPERIMENTAL INVESTIGATION OF A HIGH- VOLTAGE ELECTRON-BOMBARDMENT ION THRUSTER.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
D. C. Byers. 1968, 44p NASA-TM-X-52429
Refs Conf- Presented At the Spring Natl. Meeting of the Electrochem. Soc., Boston, 5-9 May, 1968

Descriptors: *Ion beams, *Ionization potentials, *Mercury (metal), *Performance tests, *Rocket engines, Current density, Electric current, Electric fields, Electron accelerators, Electrostatic propulsion.

For abstract, see STAR 06 12.
N68-22370 HC$3.00 MF$0.65

21D. Fuels

THERMODYNAMIC PROPERTIES OF ORGANIC DERIVATIVES OF THE LIGHTER ELEMENTS.
Bureau of Mines Bartlesville Okla Petroleum Research Center
For primary bibliographic entry see Field 7D.
AD-669 369 HC$3.00 MF$0.65

OPEN FIRES. VOLUME I.
Instituto Nacional de Tecnica Aeroespacial, Madrid (Spain).
For primary bibliographic entry see Field 21B.
PB-178 193 HC$3.00 MF$0.65

21E. Jet and Gas Turbine Engines

THE ROLE OF PROJECT HISTORIES IN THE STUDY OF R AND D,
RAND Corp., Santa Monica, Calif.
For primary bibliographic entry see Field 5B.
AD-458 062 HC$3.00

ACOUSTIC SCALING BETWEEN MODEL COLD FLOW AND HOT FLOW JETS.
Boeing Co Renton Wash Commercial Airplane Div
For primary bibliographic entry see Field 1C.
AD-669 219 HC$3.00 MF$0.65

SYNCHRONOUS JET ENGINE (SINKHRONNYI REAKTIVNYI DVIGATEL),
Foreign Technology Div Wright-Patterson AFB Ohio
A. M. Nanos, S. I. Dudchenko, and Yu. V. Kondrashkin. 19 Jul 67, 7p Rept no. FTD-HT-23-890-67
Unedited rough draft trans. of Patent (USSR) 174 704, 26 Jul 63 2p, by D. Dion.

Descriptors: (*Jet engines, Patents), Turbine stators, Weight, Efficiency, USSR.
Identifiers: Translations.

The report describes a synchronous jet engine with a stator made in the form of a toroidal packet with teeth on its internal surface. The stator also carries a distributed winding, while the engine's toothed rotor carries no winding. To lower the engine weight and to increase its efficiency, teeth are also produced on the outer surface of the packet, while the rotor consists of two active units mounted concentrically on the opposite sides of the stator. (Author)
AD-669 276 HC$3.00 MF$0.65

PRODUCTION OF GAS TURBINE MOTORS (CHAPTERS IV AND V),
Foreign Technology Div Wright-Patterson AFB Ohio
A. M. Abramov, I. L. Zelikov, M. F. Idzon, A. B. Konarev, and D. Z. Mityashkin. 6 Jun 67, 146p Rept no. FTD-MT-67-18
Edited machine trans. of mono. Proizvodstvo Gazoturbinnykh Dvigatelei, n.p., 1966 p151-282.

Descriptors: (*Gas turbines, Production), Material forming, Welding, Temperature, Welds, Joints, Stainless steel, Alloys, USSR.
Identifiers: Cold stamping, Translations.

The report is a 1966 publication of two chapters of the book on machine building. Chapter IV, entitled 'Manufacture of Parts by Cold Stamping' includes sections on all phases of this technique. Chapter V, entitled 'Manufacture of Parts by Welding' is similarly organized regarding the welding process. Basic methods are mentioned and directions given for suitable application of each type of operation, mainly in tabular outline. (Author)
AD-669 303 HC$3.00 MF$0.65

JOURNAL OF MECHANICAL ENGINEERING, VOL. 13, NO. 4, 1965 (SELECTED ARTICLES).
Foreign Technology Div Wright-Patterson AFB Ohio
14 Jul 67, 83p Rept no. FTD-HT-23-958-67
Unedited rough draft trans. of Chi Hsieh Kung Ch'eng Hsueh Pao (Chinese People's Republic), v13 n4 p1-42 1965.

Descriptors: (*Turbojet engines, Combustion chambers), (*Gas turbine rotors, Air cooled), Heat transfer, Film cooling, Gas turbines, China.
Identifiers: Translations.

Contents: Heat transfer in turbojet combustion chambers and experimentation on film cooling effects; Experimentation on air-cooled gas turbine rotors.
AD-669 427 HC$3.00 MF$0.65

STATE OF ART AND DEVELOPMENT OF VESSEL POWER INSTALLATIONS ABROAD (SOSTOYANIE I RAZVITIE KORABELNYKH ENERGETISCHESKIKH USTANOVOK ZA RUBEZHOM),
Naval Ship Systems Command Washington D C
For primary bibliographic entry see Field 13J.
AD-669 602 HC$3.00 MF$0.65

DESIGN AND EVALUATION OF A HIGH TEMPERATURE RADIAL TURBINE.
Pratt and Whitney Aircraft West Palm Beach Fla Florida Research and Development Center
For primary bibliographic entry see Field 1C.
AD-669 664 HC$3.00 MF$0.65

EVALUATION OF THE DUST CLOUD GENERATED BY HELICOPTER ROTOR DOWNWASH.
MSA Research Corp Evans City Pa
For primary bibliographic entry see Field 1C.
AD-669 676 HC$3.00 MF$0.65

ANALYSIS OF FAN-TURBINE EFFICIENCY CHARACTERISTICS IN TERMS OF SIZE AND STAGE NUMBER.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A. J. Glassman, and W. L. Stewart. May 68, 19p NASA-TM-X-1581
Contract 126-15-02-17-22

Descriptors: *High aspect ratio, *Performance prediction, *Structural design, *Turbofan engines, Aircraft engines, Axial flow turbines, Dimensions, High thrust, Specific impulse, Turbocompressors.

For abstract, see STAR 06 12.
N68-22725 HC$3.00 MF$0.65

INTEGRATED MARINE STEAM TURBINE PROPULSION PLANT.
Combustion Engineering, Inc., New York.
For primary bibliographic entry see Field 3J.
PB-177 848 HC$3.00 MF$0.65

21F. Nuclear Propulsion

RADIOISOJET MICROTHRUSTER TEST A SUMMARY REPORT,
Mound Lab., Miamisburg, Ohio.
E. W. Johnson, and J. E. Glaub. 21 Apr 67, 22p
Contract AT (33-1)-GEN-53

Descriptors: (*Spacecraft nuclear propulsion, Radioactive isotopes), Liquid rocket propellants, Ammonia, Heating, Promethium.
Identifiers: Radioisotope heat sources, Radioisojet microthrusters.

For abstract, see NSA 22 10.
MLM-1437 HC$3.00 MF$0.65

SOME ASPECTS OF ADVANCED PROPULSION SYSTEMS APPLICATIONS.
European Space Vehicle Launcher Development Organization, Paris (France). Studies and Exptl. Work Directorate.
For primary bibliographic entry see Field 22D.
For abstract, see STAR 06 12.
N68-21907 HC$3.00 MF$0.65

STUDIES OF SPECIFIC NUCLEAR LIGHT BULB AND OPEN-CYCLE VORTEX STABILIZED GASEOUS NUCLEAR ROCKET ENGINES.
United Aircraft Corp., East Hartford, Conn.
H. E. Bauer, and G. H. Mc Lafferty. Apr 68, 102p NASA-CR-1030, F-910093-37
Contract NASW-847
Coll- 102 P Refs

Descriptors: *Fluid dynamics, *Gaseous rocket propellants, *Nuclear rocket engines, *Rocket engine design, Containment, Cooling systems, Ener-

Group 21F — Nuclear propulsion

gy transfer, Liquid hydrogen, Thermal radiation, Vortices.

For abstract, see STAR 06 12.
N68-22038 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF RADIAL-INFLOW VORTEXES IN JET-INJECTION AND ROTATING PERIPHERAL-WALL WATER VORTEX TUBES.

United Aircraft Corp., East Hartford, Conn.
A. Travers. Apr 68, 38p NASA-CR-1028, F-910091-14
Contract NASW-847
Coll- 38 P Refs

Descriptors: *Flow stability, *Fluid dynamics, *Hilsch tubes, *Stagnation flow, *Vortex injectors, Axial flow, Bypasses, Radial flow, Surface properties, Vortex breakdown, Wall ets.

For abstract, see STAR 06 12.
N68-22088 HC$3.00 MF$0.65

21G. Reciprocating Engines

STATE OF ART AND DEVELOPMENT OF VESSEL POWER INSTALLATIONS ABROAD (SOSTOYANIE I RAZVITIE KORABELNYKH ENERGETISCHESKIKH USTANOVOK ZA RUBEZHOM),

Naval Ship Systems Command Washington D C
For primary bibliographic entry see Field 13J.
AD-669 602 HC$3.00 MF$0.65

21H. Rocket Motors and Engines

INNOVATION IN LIQUID PROPELLANT ROCKET TECHNOLOGY.

Final rept.,
Office of Research Analyses Holloman AFB N Mex
Roderick W. Clarke. Mar 68, 348p* Rept no. ORA-68-0006

Descriptors: (*Rocket motors (Liquid propellant), Design), Industrial research, Rocket propulsion, History, Rocket components, Performance (Engineering), Research program administration, Theses.
Identifiers: *Technological innovation, Transfer of technology.

The investigation identifies patterns of innovation in the technology of liquid propellant rocket engines (LPRE). Quantitative methods are used to gain an understanding of the innovative process based on large-sample statistics. Specifically, it seeks to determine the manner and extent in which LPRE technology innovation has evolved; the degree to which innovations have diffused; and the factors of the environment within which innovation has taken place. The two principal tools used are a modeling of the functional and structural characteristics of LPRE to permit quantitative identification of specific innovations, and a mapping process which traces innovative diffusion through specific communication channels. (Author)
AD-669 334 HC$3.00 MF$0.65

A CRITICAL REVIEW OF ANALYTICAL METHODS FOR ESTIMATING CONTROL FORCES PRODUCED BY SECONDARY INJECTION: THE TWO DIMENSIONAL PROBLEM,

Naval Ordnance Lab White Oak Md
Michael J. Werle. 4 Jan 68, 98p* Rept no. NOLTR-68-5

Descriptors: (*Secondary injection, Two-dimensional flow), Control jets, Thrust, Interactions, Supersonic characteristics, Reviews, Flow separation, Boundary layer, Jet mixing flow, Mathematical models.

The problem discussed is that of theoretically predicting the normal force induced in the boundary layer separation region immediately ahead of a secondary injection port. Attention was limited to the two-dimensional problem of sonic or supersonic normal injection into supersonic or hypersonic mainstreams. A critical review of available experimental studies was conducted in order to isolate those data best representing a two-dimensional state. The resulting compilation of experimental results was thereafter employed as a basis of comparison for available theoretical and empirical flow models. As a result it was found that analytical means are only capable of rough quantitative estimates of control jet effectiveness and that a more detailed flow model is needed to further explain observed phenomenon. The basic features of such a model are formulated and its conceptual validity demonstrated through comparison with experimental results. Problem areas requiring further research are also discussed in detail. (Author)
AD-669 445 HC$3.00 MF$0.65

STUDY OF PROPELLANT VALVE LEAKAGE IN A VACUUM FINAL SUMMARY REPORT.

Atlantic Research Corp., Alexandria, Va.
J. P. Copeland, R. D. Gift, J. M. Miller, J. A. Simmons, and J. M. Spurlock. Apr 68, 12p NASA-CR-1047
Contract NAS9-4494
Coll- 12 P Ref

Descriptors: *Control valves, *Leakage, *Liquid rocket propellants, *Vacuum effects, Combustion chambers, Evaporative cooling, Freezing, Ignition, Liquid propellant rocket engines, Manifolds.

For abstract, see STAR 06 12.
N68-21893 HC$3.00 MF$0.65

THEORY OF A SUPERSONIC GAS EJECTOR WITH A CYLINDRICAL MIXING CHAMBER.

Teoriya Sverkhzvukovogo Gazovogo Ezhektora S Tsilindricheskoy Kameroy Smeshcheniya
Aztec School of Languages, Inc., Acton, Mass.
YU. N. Vasilyev. Apr 68, 69p NASA-TT-F-11554
Contract NASW-1692
Coll- 69 P Refs Tran- Transl. Into English From the Publ. "lopatochniye Mashini I Struynyye Apparati, Sbornik Statey" Moscow, Mashinostrpress, 1967 P 171-235

Descriptors: *Cylindrical chambers, *Ejectors, *Gas flow, *Supersonic nozzles, Enthalpy, Flow equations, High pressure, Low pressure, Mathematical models.

For abstract, see STAR 06 12.
N68-22037 HC$3.00 MF$0.65

COMPUTER SIMULATION OF HIGH FREQUENCY COMBUSTION INSTABILITY AND ITS SUPPRESSION FINAL REPORT.

Pratt and Whitney Aircraft, West Palm Beach, Fla. Research and Development Center.
For primary bibliographic entry see Field 21B.
For abstract, see STAR 06 12.
N68-22095 HC$3.00

EXPERIMENTAL EVALUATION OF 7.82-INCH (19.8-CM) DIAMETER THROAT INSERTS IN A STORABLE-PROPELLANT ROCKET ENGINE.

National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
D. A. Peterson, and J. M. Winter. Apr 68, 47p NASA-TM-X-1463
Contract 128-31-03-01-22

Descriptors: *Rocket engine design, *Storable propellants, *Thrust chambers, Ablative materials, Graphite, Liquid propellant rocket engines, Materials tests, Oxidation, Propellant storage, Structural analysis, Tungsten compounds.

For abstract, see STAR 06 12.
N68-22272 HC$3.00 MF$0.65

HYBRID DEVELOPMENT PLANNING MANUAL.

Douglas Aircraft Co., Inc., Huntington Beach, Calif. Missile and Space Systems Div.
M. B. Adams, P. H. Bialla, and R. H. Michaelis. Mar 68, 124p NASA-CR-66598, DAC-58081
Contract NAS1-7289

Descriptors: *Costs, *Hybrid propulsion, *Manuals, *Scheduling, Mission planning, Product development, Production engineering.

For abstract, see STAR 06 12.
N68-22300 HC$3.00 MF$0.65

INDUCER DYNAMICS FULL-FLOW, FULL-ADMISSION HYDRAULIC TURBINE DRIVE INTERIM REPORT FOR TASKS 1, 2, AND 3.

Aerojet-general Corp., Sacramento, Calif. Liquid Rocket Operations.
P. S. Buckmann, J. Farquhar, B. K. Lindley, E. B. Mc Kinney, and G. K. Olson. 1968, 224p NASA-CR-72378, AGC-7977-T1
Contract NAS3-7977

Descriptors: *Computerized simulation, *Engine testing laboratories, *Hydraulic equipment, *Intake systems, *Pumps, *Turbine blades, Fuel systems, Hydrodynamics, Liquid hydrogen, Nuclear engine for rocket vehicles.

For abstract, see STAR 06 12.
N68-22325 HC$3.00 MF$0.65

EMITTANCE OF ABLATIVE MATERIALS FINAL REPORT.

TRW Systems, Redondo Beach, Calif.
B. E. Newman. 1967, 63p NASA-CR-62063
Contract NAS9-4518

Descriptors: *Ablative materials, *Emittance, *Linings, *Temperature effects, Fibers, Magnesium oxides, Rocket engine design, Silicon dioxide, Thermal protection, Thermodynamic properties.

For abstract, see STAR 06 12.
N68-22415 HC$3.00 MF$0.65

BIPROPELLANT AND QUADREDUNDANT VALVES, VOLUME I FINAL REPORT.

Thiokol Chemical Corp., Denville, N. J. Reaction Motors Div.
17 Jul 67, 66p NASA-CR-61732, RMD-6203-Q2, V. 1
Contract NAS8-15486

Descriptors: *Fuel valves, *Liquid rocket propellants, *Performance tests, *Torque motors, Hydraulic equipment, Quality control, Rocket engines, Structural design.

For abstract, see STAR 06 12.
N68-22530 HC$3.00 MF$0.65

DESIGN, DEVELOPMENT, FABRICATION, TEST, AND DELIVERY OF ELECTROTHERMAL ENGINE SYSTEMS.

Avco Corp., Lowell, Mass. Space Systems Div.
T. K. Pugmire. Nov 67, 122p NASA-CR-72362, AVSSD-0062-68-RR
Contract NAS3-7934

Descriptors: *Electrothermal engines, *Satellite attitude control, *Stationkeeping, *Systems engineering, Environmental tests, Evaluation, Fabrication, Propulsion system configurations, Quality control, Resistojet engines, Thrust control.

For abstract, see STAR 06 12.
N68-22586 HC$3.00 MF$0.65

INVESTIGATIONS IN CHEMICAL ROCKET PROPULSION FINAL REPORT, 1 JUL. 1964 - 31 DEC. 1967.

Purdue Univ., Lafayette, Ind. Jet Propulsion Center.
C. M. Ehresman. 31 Dec 67, 23p NASA-CR-94386
Grant NSG-592

Descriptors: *Film cooling, *Nozzle geometry, *Propellant combustion, *Solid propellant ignition, Ammonium perchlorates, Chemical reactions, Combustion efficiency, Combustion stability, Gas flow, Nozzle flow.

For abstract, see STAR 06 12.
N68-22683 HC$3.00 MF$0.65

PROPELLANT LEAKAGE DETECTION SYSTEM FINAL REPORT.

Spacelabs, Inc., Van Nuys, Calif.
For primary bibliographic entry see Field 14B.
For abstract, see STAR 06 12.
N68-22780 HC$3.00 MF$0.65

AN INTRODUCTION TO HEAT TRANSFER IN HYDROGEN/OXYGEN ROCKET COMBUSTION CHAMBERS.

Explosives Research and Development Establishment, Waltham Abbey (England).
H. Ziebland. 29 Apr 66, 26p ERDE-1/S/66

Descriptors: *Combustion chambers, *Heat transfer coefficients, Aerodynamic characteristics, Combustion physics, Convective heat transfer, Flow geometry, Hydrogen, Oxygen, Radiative heat transfer, Rocket engine design, Temperature distribution, Thermodynamics, Wall temperature.

For abstract, see STAR 06 12.
N68-22816 HC$3.00 MF$0.65

POSITIVE GAGING SYSTEM, FEASIBILITY STUDY FINAL REPORT, 15 MAY - 15 NOV. 1967.

Bendix Corp., Davenport, Iowa. Instruments and Life Support Div.
17 Apr 68, 140p NASA-CR-92091, PUBL.-3914.1-68-2
Contract NAS9-6751

Descriptors: *Fuel gages, *Liquid rocket propellants, *Propellant tanks, *Radio frequencies, Aerozine, Apollo spacecraft, Lunar module, Rocket oxidizers, Scale models.

For abstract, see STAR 06 12.
N68-22879 HC$3.00 MF$0.65

C-1 ENGINE - PROPELLANT VALVE QUALIFICATION, VOLUME 2, BOOK 2 FINAL REPORT.

Thiokol Chemical Corp., Denville, N. J. Reaction Motors Div.
17 Jul 67, 228p NASA-CR-61735, RMD-6203-Q2, V. 2, BK. 2
Contract NAS8-15486

Descriptors: *Fuel valves, *Liquid rocket propellants, *Qualifications, *Rocket engines, *Tests, Attitude control, Performance tests, Propellant tests, Rocket engine control, Shock tests, Systems engineering, Torque motors.

For abstract, see STAR 06 12.
N68-22972 HC$3.00

21I. Rocket Propellants

PARALLEL PLATE PLASTOMETRY OF PLASTIC PROPELLANT: PART I: DETERMINATION OF YIELD STRESS,

Explosives Research and Development Establishment Waltham Abbey (England)
W. A. Dukes. 30 Nov 67, 33p Rept no. ERDE-14/R/67

Descriptors: (*Solid rocket propellants, Stresses), Compressive properties, Strain hardening, Pressure, Shear stresses, Viscosity, Theory, Cylindrical bodies, Loading (Mechanics), Mathematical analysis, Great Britain, Plastics.
Identifiers: Plastic propellants.

Various theoretical analyses of the equilibrium compression between parallel plates of cylindrical specimens of plastic materials have been compared with the experimental behaviour of plastic propellants. Three theories have been shown to be inapplicable, but one, due to Meyerhof and Chaplin, agrees well with experiment. Thus, the fundamental rheological property of yield stress may now be derived from this simple test, independent of the dimensions of the specimen. It also has been shown that a particular propellant, RD 2428/T2, strain-hardens linearly: that is, the yield stress is a linear function of the strain over a wide range. (Author)
AD-669 423 HC$3.00 MF$0.65

EXPERIMENT OF DAMAGE CONTROL MATERIALS AND METHODS FOR FLEET HANDLING OF PACKAGED LIQUID PROPELLANTS.

Quarterly rept. no. 3, 1 Jan-31 Mar 68,
Allied Chemical Corp Morristown N J Industrial Chemicals Div
R. J. Foley. Apr 68, 10p
Contract N00019-67-C-0538

Descriptors: (*Liquid rocket propellants, Handling), Liquid rocket fuels, Hydrazine, Gasproof clothing, Synthetic rubber, Vapors, Breathing apparatus, Oxygen masks, Damage control, Naval personnel, Chlorine compounds, Fluorides, Compatibility, Gas analysis, Nylon, Toxic tolerances, Hydrazine derivatives.
Identifiers: Chlorine trifluoride, MHF-3 fuels.

An investigation is being conducted to evaluate the compatibility of certain damage control materials and equipment with chlorine trifluoride (CTF), a liquid propellant. The trace gas analyzer previously tested and approved for CTF service was calibrated for MHF-3 in the range of 0 to 20 ppm. The analyzer was calibrated under stable and shipboard-like conditions and produced protective responses. The prototype protective suit made of the neoprene-coated nylon cloth was received from the manufacturer, but was rejected because it did not comply with our specifications. Exposure tests were conducted on the skin of live rabbits with low concentrations of CTF. It was found that a 30 minute exposure of CTF even as dilute as 0.1% had an adverse effect on this skin.
AD-669 437 HC$3.00 MF$0.65

GROWTH OF SINGLE CRYSTALS OF AMMONIUM PERCHLORATE FROM AQUEOUS SOLUTION,

Explosives Research and Development Establishment Waltham Abbey (England)
For primary bibliographic entry see Field 20B.
AD-669 620 HC$3.00 MF$0.65

SUMMARY OF A STUDY OF THE LOW-PRESSURE COMBUSTION OF SOLID PROPELLANTS.

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
L. D. Strand. 15 Apr 68, 34p NASA-CR-94238, JPL-TR-32-1242
Contract NAS7-100

Descriptors: *Combustion stability, *Solid propellants, Combustion chambers, Nozzle flow, Particle size distribution, Pressure distribution, Propellant chemistry, Rocket engine design, Solid propellant rocket engines.

For abstract, see STAR 06 12.
N68-21865 HC$3.00 MF$0.65

DYNAMIC STABILITY AND PARAMETRIC RESONANCE IN CYLINDRICAL PROPELLANT TANKS FINAL REPORT.

Southwest Research Inst., San Antonio, Tex.
For primary bibliographic entry see Field 20K.
For abstract, see STAR 06 12.
N68-21873 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATIONS OF LIQUID PROPELLANT COMBUSTION PROCESSES USING STREAK PHOTOGRAPHY.

Princeton Univ., N. J. Dept. of Aerospace and Mechanical Sciences.
For primary bibliographic entry see Field 21B.
For abstract, see STAR 06 12.
N68-21915 HC$3.00 MF$0.65

DEVELOPMENT OF CRYOGENIC POSITIVE EXPULSION BLADDERS FINAL REPORT, JUN. 18, 1965 - DEC. 31, 1967.

Beech Aircraft Corp., Boulder, Colo.
J. E. Penner, and D. H. Pope. 20 Jan 68, 398p
NASA-CR-72115, ER-15091
Contract NAS3-6288

Descriptors: *Cryogenic fluids, *Expulsion, *Liquid hydrogen, *Polymers, Flexibility, Liquid filled shells, Mylar (trademark), Permeability, Tanks (containers).

For abstract, see STAR 06 12.
N68-21916 HC$3.00 MF$0.65

A STUDY OF LIQUID PROPELLANT BEHAVIOR DURING PERIODS OF VARYING ACCELERATIONS SUMMARY REPORT.

Lockheed Missiles and Space Co., Sunnyvale, Calif.
23 May 67, 11p NASA-CR-92082, LMSC-A874729
Contract NAS9-5174

Descriptors: *Cryogenic rocket propellants, *Space storage, *Storable propellants, Apollo project, Cryogenic fluid storage, Liquid filled shells, Liquid sloshing, Propellant storage, Propellant tanks, Storage stability.

For abstract, see STAR 06 12.
N68-21975 HC$3.00 MF$0.65

FLEXIBLE VACUUM JACKET DEVELOPMENT FINAL REPORT.

Goodyear Aerospace Corp., Akron, Ohio.
For primary bibliographic entry see Field 13D.
For abstract, see STAR 06 12.
N68-22114 HC$3.00 MF$0.65

THE LITERATURE OF LOW- G PROPELLANT BEHAVIOR.

Lockheed Missiles and Space Co., Sunnyvale, Calif.
5 May 67, 45p NASA-CR-92081, LMSC-A874730
Contract NAS9-5174

Descriptors: *Bibliographies, *Heat transfer, *Liquid rocket propellants, *Reduced gravity, Fluid dynamics, Fluid mechanics, Liquid sloshing, Stability, Ullage.

For abstract, see STAR 06 12.
N68-22346 HC$3.00 MF$0.65

ENGINEERS HANDBOOK - LOW- G PROPELLANT BEHAVIOR.

Lockheed Missiles and Space Co., Sunnyvale, Calif.
M. P. Hollister, and H. M. Satterlee. 15 May 67, 169p NASA-CR-92083, LMSC-A874831
Contract NAS9-5174

Descriptors: *Handbooks, *Liquid rocket propellants, *Propellant tanks, *Reduced gravity, *Systems engineering, Aeronautical engineering, Cryo-

genic rocket propellants, Dynamic characteristics, Flow stability, Heat transfer, Linear prediction, Liquid sloshing, Numerical analysis, Storable propellants.

For abstract, see STAR 06 12.
N68-22463 HC$3.00 MF$0.65

INVESTIGATIONS IN CHEMICAL ROCKET PROPULSION FINAL REPORT, 1 JUL. 1964 - 31 DEC. 1967.
Purdue Univ., Lafayette, Ind. Jet Propulsion Center.
For primary bibliographic entry see Field 21H.
For abstract, see STAR 06 12.
N68-22683 HC$3.00 MF$0.65

A STUDY OF LIQUID PROPELLANT BEHAVIOR DURING PERIODS OF VARYING ACCELERATIONS FINAL REPORT.
Lockheed Missiles and Space Co., Sunnyvale, Calif.
H. Cohan, M. P. Hollister, and H. M. Satterlee.
30 Jun 67, 509p NASA-CR-92084, LMSC-A874728
Contract NAS9-5174

Descriptors: *Apollo spacecraft, *Liquid rocket propellants, *Propellant tanks, Baffles, Controllability, Damping, Fuel control, Liquid sloshing, Propulsion.

For abstract, see STAR 06 12.
N68-23024 HC$3.00 MF$0.65

22. SPACE TECHNOLOGY

22A. Astronautics

NINETEEN SEVENTY TWO VENUS FLYBY/ENTRY PROBE MISSION STUDY, BOOK 2 FINAL TECHNICAL REPORT.
Avco Corp., Lawrence, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
Apr 68, 504p NASA-CR-94234, AVSSD-080-68-RR, BK. 2
Contracts NAS7-100, JPL-951964
Prep- Prepared for Jpl

Descriptors: *Cost estimates, *Flyby missions, *Space missions, *Systems engineering, *Venus probes, Aerospace environments, Equipment specifications, Schedules, Spacecraft instruments, Venus (planet).

For abstract, see STAR 06 12.
N68-21888 HC$3.00 MF$0.65

A LIGHTING STRATEGY FOR LUNAR ORBITER MISSION DESIGN.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
For primary bibliographic entry see Field 14E.
For abstract, see STAR 06 12.
N68-21942 HC$3.00 MF$0.65

HYPERVELOCITY HEAT TRANSFER STUDIES IN SIMULATED PLANETARY ATMOSPHERES FINAL REPORT.
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Sciences Lab.
Mar 68, 245p NASA-CR-94317
Contracts NAS7-100, JPL-950297
Prep- Prepared for Jpl

Descriptors: *Atmospheric entry simulation, *Convective heat transfer, *Planetary atmospheres, *Radiative heat transfer, *Spacecraft reentry, Gas mixtures, Shock tubes, Shock waves, Ultraviolet radiation.

For abstract, see STAR 06 12.
N68-22230 HC$3.00 MF$0.65

RUSSIAN ROCKETRY, A HISTORICAL SURVEY.
National Aeronautics and Space Administration, Washington, D. C.
I. A. Slukhai. 1968, 152p NASA-TT-F-426, TT-67-51363
Tran- Transl. Into English of the Publ. "rakety I Traditsii" Moscow, Voennoe Izd. Min. Oborony Sssr, 1965 Prep- Published By Israel Program for Sci. Transl. for Nasa and Nsf

Descriptors: *Military technology, *Rocket vehicles, *Space exploration, *U.S.S.R., Histories, Meteorological satellites, Nuclear weapons.

For abstract, see STAR 06 12.
N68-22262 HC$3.00 MF$0.65

DEPARTMENT OF DEFENSE SELENODETIC CONTROL SYSTEM 1966.
Army Map Service, Washington, D. C.
Jan 67, 180p NASA-CR-92078
NASA ORDER T-37794/G/

Descriptors: *Lunar craters, *Lunar photographs, *Photointerpretation, *Selenography, Least squares method, Tables (data).

For abstract, see STAR 06 12.
N68-22332 HC$3.00 MF$0.65

A STUDY TO DETERMINE OPTIMUM LUNAR LIGHTING CONDITIONS FOR VISUAL SELECTION OF LEM TOUCHDOWN POINT FINAL REPORT, 12 OCT. 1965 - 15 AUG. 1966.
Hughes Aircraft Co., El Segundo, Calif. Space Systems Div.
T.-Y. Feng. Jan 67, 99p NASA-CR-92077, SSD-60293R
Contract NAS9-5321

Descriptors: *Human factors engineering, *Illuminating, *Lunar landing sites, *Lunar module, *Visual tasks, Environment simulation, Light sources, Lunar topography, Optical equipment, Optical range finders, Optimization, Selectivity, Sun, Trajectory optimization, Visual discrimination.

For abstract, see STAR 06 12.
N68-22466 HC$3.00 MF$0.65

SPACE SCIENCES DATA PROCESSING.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
G. H. Ludwig. May 68, 19p NASA-TN-D-4508
Contract 311-07-11-01-51

Descriptors: *Aerospace sciences, *Data acquisition, *Data processing, *Scientific satellites, Data reduction, Data transmission, Information theory, Onboard equipment, Spacecraft communication.

For abstract, see STAR 06 12.
N68-22510 HC$3.00 MF$0.65

PLAN OF OPERATIONS - FEBRUARY 1968. GEODESY PROGRAM RCP 133.
Aztec School of Languages, Inc., Acton, Mass.
Apr 68, 36p NASA-TT-F-11657
Contract NASW-1692
Coll- 36 P Tran-transl. Into English of the Publ. "plan D'operations 2/68, Campagne de Geodesy Rcp 133" Paris, Centre Natl. D'etudes Spatiales, Feb. 1968 P 1-45

Descriptors: *Geodetic coordinates, *Geodetic satellites, *Project management, Africa, Data transmission, Europe, Lasers, Management planning, Satellite tracking, Telemetry.

For abstract, see STAR 06 12.
N68-22634 HC$3.00

LUNAR SOIL MECHANICS.
Massachusetts Inst. of Tech., Cambridge. Soil Mechanics Div.
Apr 68, 115p NASA-CR-94424
Grant NSG-496

Descriptors: *Lunar exploration, *Lunar geology, *Lunar soil, *Soil science, Lunar landing sites, Lunar surface vehicles, Problem solving, Spacecraft stability.

For abstract, see STAR 06 12.
N68-22768 HC$3.00 MF$0.65

PHOTOHELIOGRAPH STUDY FOR THE APOLLO TELESCOPE MOUNT.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
For primary bibliographic entry see Field 3A.
For abstract, see STAR 06 12.
N68-22923 HC$3.00 MF$0.65

THE VOYAGER PLANETARY QUARANTINE MODEL 1973 MISSION.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
R. G. Chamberlain. 1 Jun 67, 32p NASA-CR-94387, JPL-TM-33-252
Contract NAS7-100

Descriptors: *Interplanetary flight, *Linear prediction, *Mars (planet), *Mathematical models, *Spacecraft contamination, Microorganisms, Mission planning, Probability theory, Unmanned spacecraft, Voyager project.

For abstract, see STAR 06 12.
N68-22933 HC$3.00 MF$0.65

VENUS FLYBY/ENTRY PROBE MISSION STUDY, 1972. BOOK 1 - SUMMARY, INTRODUCTION, MISSION DEFINITION, ENTRY PROBE SYNTHESIS FINAL TECHNICAL REPORT.
Avco Corp., Lowell, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Space Systems Div.
Apr 68, 772p NASA-CR-94406, AVSSD-080-68-RR, BK. 1
Contracts NAS7-100, JPL-951964
Prep- Prepared for Jpl

Descriptors: *Flyby missions, *Structural design, *Systems analysis, *Trajectory analysis, *Venus probes, Aerodynamics, Mission planning, Reliability engineering, Spacecraft shielding, Transfer orbits.

For abstract, see STAR 06 12.
N68-22994 HC$3.00 MF$0.65

22B. Spacecraft

RADIOMETRIC TRACKING OF SMALL ISLANDS.
Ballistic Research Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 8B.
AD-669 241 HC$3.00 MF$0.65

PRESSURE DISTRIBUTION ON A CONE-CYLINDER-FLARE BODY AT MACH 14 IN THE PRESENCE OF FLOW SEPARATION.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-669 328 HC$3.00 MF$0.65

INVESTIGATION OF MATERIALS COMBUSTIBILITY, FIRE, AND EXPLOSION SUPPRESSION IN A VARIETY OF ATMOSPHERES.
Dynamic Science Corp Monrovia Calif
For primary bibliographic entry see Field 21B.
AD-669 349 HC$3.00 MF$0.65

METEOROLOGICAL ROCKET DATA AND PREDICTING THE ONSET OF THE SOUTHWEST MONSOON OVER INDIA AND SOUTHEAST ASIA.
Environmental Technical Applications Center (Air Force) Washington D C
For primary bibliographic entry see Field 4B.
AD-669 364 HC$3.00 MF$0.65

TEST PROCEDURE FOR THE FREE-FREE GROUND VIBRATION TESTS ON THE ASSEMBLED OAO SPACECRAFT, AGENA, ATLAS, AND FAIRINGS AT POINT LOMA,
General Dynamics/Astronautics San Diego Calif
J. D. Jones. 19 Feb 64, 157p Rept no. GDA-69B-1811-P3
Contract AF 04 (649)-249

Descriptors: (*Scientific satellites, Structural properties), Vibration, Astronomical observatories, Spaceborne, Instrumentation, Payload, Propellant tanks, Booster motors, Models (Simulations), Predictions, Vibrators (Mechanical), Programming (Computers), Checkout procedures, Liquid rocket propellants, Analysis of variance, Stresses, Frequency, Compatibility.
Identifiers: Computer analysis, OAO, Atlas launch vehicle, Agena.

This report describes the specimens, equipment, fixtures, instrumentation, objectives, parameters, methods, and procedures that will be used in the accomplishment of an orbiting astronomical observatory (OAO) free-free ground vibration test. (Author)
AD-669 367 HC$3.00 MF$0.65

RADIATION OF A HERTZ DIPOLE MOVING AROUND A CONDUCTING SPHERE.
California Inst of Tech Pasadena Antenna Lab
For primary bibliographic entry see Field 20N.
AD-669 370 HC$3.00 MF$0.65

SELF-ADJUSTING SYSTEM WITH NONLINEAR MODEL (SAMONASTRAIVAYUSHCHAYASYA SISTEMA S NELINEINOI MODEL YU),
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 12A.
AD-669 515 HC$3.00 MF$0.65

THE IN-ORBIT THERMAL PERFORMANCE OF THE ARIEL III SPACECRAFT, PART I.
Rept. for May-Sep 67,
Royal Aircraft Establishment Farnborough (England)
E. C. Semple. Oct 67, 18p Rept no. RAE-TR-67253-Pt-1

Descriptors: (*Scientific satellites, Temperature), Elliptical orbit trajectories, Surface properties, Solar radiation, Absorption, Contamination, Degradation, Paints, Predictions, Great Britain.
Identifiers: Ariel 3 satellite, Protective coatings.

Temperatures measured on the Ariel III spacecraft during its first four months in orbit are presented, and a comparison is made with the temperatures predicted before launch. (Author)
AD-669 621 HC$3.00 MF$0.65

AIR DENSITY AT HEIGHTS NEAR 190 km IN 1966-7, FROM THE ORBIT OF SECOR 6.
Royal Aircraft Establishment Farnborough (England)
For primary bibliographic entry see Field 4A.
AD-669 697 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY-BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME I. USER'S MANUAL.
Douglas Aircraft Co., Inc., Long Beach, Calif.
For primary bibliographic entry see Field 1A.
AD-817 158 HC$3.00 MF$0.65

HYPERSONIC ARBITRARY BODY AERODYNAMIC COMPUTER PROGRAM. VOLUME II. PROGRAM FORMULATION AND LISTINGS.
Douglas Aircraft Co., Inc., Long Beach, Calif.
For primary bibliographic entry see Field 1A.
AD-817 159 HC$3.00 MF$0.65

CONCEPT, DESIGN, AND PERFORMANCE OF THE MSC SPACECRAFT ACOUSTIC LABORATORY.
National Aeronautics and Space Administration. Manned Spacecraft Center, Langley Station, Va.
For primary bibliographic entry see Field 14B.
For abstract, see STAR 06 12.
N68-21874 HC$3.00 MF$0.65

STABILITY CRITERIA FOR THE OAO COARSE POINTING MODE, PART 2 FINAL REPORT.
General Electric Co., Philadelphia, Pa. Grumman Aircraft Engineering Corp., Bethpage, N. Y. Missile and Space Div.
S. E. Moskowitz. Nov 67, 58p NASA-CR-73166, DOC.-67SD4428
Contract NAS2-4063
Prepared for Grumman Aircraft Eng. Corp.

Descriptors: *Computer programming, *Fortran, *Oao, *Spacecraft stability, Flow charts, Logic design, Logical elements, Stability tests, Subroutines.

For abstract, see STAR 06 12.
N68-21899 HC$3.00 MF$0.65

APOLLO/ SATURN 5 - FLIGHT READINESS TEST.
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
J. N. Bardwell. 22 Sep 67, 106p NASA-TM-X-61054, SD-40002

Descriptors: *Apollo spacecraft, *Flight plans, *Ground support equipment, *Saturn 5 launch vehicles, Cape kennedy launch complex, Preflight operations, Prelaunch tests, Tables (data).

For abstract, see STAR 06 12.
N68-21910 HC$3.00

ESRO 2- B.
National Aeronautics and Space Administration, Washington, D. C.
30 Apr 68, 15p NASA NEWS RELEASE-68-75

Descriptors: *Esro 2 satellite, *Spacecraft launching, Cosmic rays, European space programs, Scout launch vehicle, Solar radiation.

For abstract, see STAR 06 12.
N68-21925 HC$3.00 MF$0.65

ANALYSIS OF CONCEPTUAL DESIGNS FOR THE VOYAGER ENTRY CAPSULE.
Philco-ford Corp., Newport Beach, Calif. Space and Re-entry Systems Div.
G. A. Cohen, R. M. Foster, and E. M. Schafer. 1968, 192p NASA-CR-66580
Contract NAS1-5554-1

Descriptors: *Pressure distribution, *Spacecraft design, *Venus probes, *Voyager project, Aerodynamic characteristics, Aerodynamic heating, Atmospheric entry, Blunt bodies, Descent trajectories, Heat transfer, Optimization, Systems engineering, Trajectory analysis.

For abstract, see STAR 06 12.
N68-21928 HC$3.00 MF$0.65

SURVEYOR 5 MISSION REPORT. PART 1 - MISSION DESCRIPTION AND PERFORMANCE.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
15 Mar 68, 240p NASA-CR-94251, JPL-TR-32-1246
Contract NAS7-100

Descriptors: *Spacecraft performance, *Surveyor lunar probes, Atlas centaur launch vehicle, Lunar landing, Spacecraft electronic equipment, Spacecraft instruments, Spacecraft launching, Spacecraft trajectories, Tracking networks.

For abstract, see STAR 06 12.
N68-21934 HC$3.00 MF$0.65

DEVELOPMENT OF ACOUSTIC TEST CONDITIONS FOR APOLLO LUNAR MODULE FLIGHT QUALIFICATION.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
W. D. Dorland, K. M. Eldred, and R. J. Wren. Mar 68, 29p NASA-TM-X-58016
Contract 914-50-20-15-72

Descriptors: *Acoustic simulation, *Apollo spacecraft, *Lunar module, *Structural analysis, Dynamic pressure, Power spectra, Prelaunch tests, Structural vibration, Vibration tests.

For abstract, see STAR 06 12.
N68-21946 HC$3.00 MF$0.65

APOLLO APPLICATIONS PROGRAM CREW MOTION EXPERIMENT PROGRAM DEFINITION AND DESIGN DEVELOPMENT.
Martin Co., Denver, Colo.
C. H. Murrish, and G. W. Smith. 1967, 456p NASA-CR-66599
Contract NAS1-7276

Descriptors: *Apollo applications program, *Computerized simulation, *Man machine systems, *Mathematical models, *Systems engineering, Apollo project, Astronaut locomotion, Digital techniques, Extravehicular activity, Human factors engineering, Mission planning, Optimization, Telemetry.

For abstract, see STAR 06 12.
N68-22151 HC$3.00

CURRENT PROGRAM AND CONSIDERATIONS OF THE FUTURE FOR EARTH RESOURCES SURVEY.
National Aeronautics and Space Administration, Washington, D. C.
For primary bibliographic entry see Field 4A.
For abstract, see STAR 06 12.
N68-22261 HC$3.00 MF$0.65

DYNAMIC STABILITY OF A 4.6-METER-DIAMETER 120 DEG CONICAL SPACECRAFT AT MACH NUMBERS FROM 0.78 TO 0.48 IN A SIMULATED MARTIAN ENVIRONMENT.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
R. J. Bendura, and C. H. Whitlock. May 68, 28p NASA-TN-D-4558
Contract 124-07-03-05-23
28 P Refs

Descriptors: *Dynamic stability, *Mars environment, *Spacecraft stability, *Subsonic speed, Atmospheric entry simulation, Conical bodies, Graphs (charts).

For abstract, see STAR 06 12.
N68-22301 HC$3.00 MF$0.65

INSTRUMENTATION AND FLIGHT REPORT ON ASTROBEE 1500 FLIGHT 16.02 GT.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
C. D. Tackett. Feb 68, 155p NASA-TM-X-63174, X-721-68-66

Descriptors: *Astrobee 1500 rocket vehicle, *Flight tests, Electronic equipment tests, Instrument errors, Payloads, Performance tests, Rocket sounding, Solid propellant rocket engines, Systems engineering, Temperature distribution.

For abstract, see STAR 06 12.
N68-22339 HC$3.00 MF$0.65

PREDICTION OF HEAT TRANSFER IN MULTIPLE GLAZE TRANSPARENCIES FINAL REPORT.
Little (Arthur D.), Inc., Cambridge, Mass.
25 Aug 66, 97p NASA-CR-92079, C-67248
Contract NAS9-4204

Descriptors: *Aerodynamic heating, *Windows, Atmospheric entry, Computer programs, Environmental tests, Heat transfer coefficients, High temperature environments, Mathematical models, Reentry physics, Thermodynamics.

For abstract, see STAR 06 12.
N68-22340 HC$3.00 MF$0.65

FEASIBILITY STUDY FOR RELIABLE MAGNETIC CONNECTION SWITCH, PHASE 2 FINAL REPORT.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Stanford Research Inst., Menlo Park, Calif.
For primary bibliographic entry see Field 9B.
For abstract, see STAR 06 12.
N68-22342 HC$3.00 MF$0.65

COATING SELECTION PROGRAM - THEORY.
General Electric Co., Philadelphia, Pa.
B. Aston, F. A. Costello, and T. P. Harper. Apr 68, 48p NASA-CR-1041, DOC.-65SD526
Contract NASW-960
Coll- 48 P Refs

Descriptors: *Heat balance, *Matrices (mathematics), *Optical reflection, *Protective coatings, *Temperature control, Explorer 26 satellite, Explorer 28 satellite, Fortran, Optimization, Thermal environments.

For abstract, see STAR 06 12.
N68-22391 HC$3.00 MF$0.65

MECHANICAL VIBRATION TRANSMISSION IN THE MARINER 69 SPACECRAFT INTERIM PROGRESS REPORT.
Bolt, Beranek, and Newman, Inc., Cambridge, Mass. Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
14 Jul 67, 41p NASA-CR-94399
Contract NAS7-100
Prep- Prepared for Jpl

Descriptors: *Mariner spacecraft, *Statistical analysis, *Vibration measurement, Adapters, Couplings, Domes (structural forms), Dynamic response, Spacecraft electronic equipment, Transfer functions, Vibration mode.

For abstract, see STAR 06 12.
N68-22772 HC$3.00 MF$0.65

22C. Spacecraft Trajectories and Reentry

MODELS FOR ANALYSIS OF THE CAPABILITIES OF GROUND BASED SENSORS IN DETERMINING THE MASS OF ORBITING BODIES,
Westinghouse Defense and Space Center Baltimore Md Surface Div
Walter J. Culver. 23 Jun 67, 176p*
ESD-TR-68-157-Vol-1
Contract F19628-67-C-0041

Descriptors: (*Satellites (Artificial), Satellite tracking systems), Mathematical models, Radar tracking, Mathematical prediction, Orbital trajectories, Determination, Electromagnetic properties, Physical properties, Drag, Equations of motion, Albedo, Computer programs.
Identifiers: *Mass determination, Minivar computer program.

This report contains a description of the models to be used in analyzing the capabilities of ground-based sensors in determining the mass of orbiting bodies, model coefficients, and the justification for their selection. Relations are derived for computing sensitivity coefficients and their coupling to mass variance. (Author)
AD-669 359 HC$3.00 MF$0.65

ORBIT EXPANSION BU MICROTHRUST. PART I. DESCRIPTION OF RESULTS.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
G. J. Davison. Sep 67, 19p Rept no. RAE-TR-67249-Pt-1

Descriptors: (*Transfer trajectories, Electric propulsion), Time, Fuel consumption, Solar radiation, Pressure, Elliptical orbit trajectories, Optimization, Satellites (Artificial), Drag.
Identifiers: Computer analysis, Radiation pressure, Transfer time, Microthrust.

The report describes the results of a study carried out for ELDO on the subject of orbit expansion from low to geostationary altitude by means of microthrust provided by an electric propulsion unit. The mathematical analysis of the problem and the computer program used to obtain the results presented herein are each published under a separate cover. (Author)
AD-669 407 HC$3.00 MF$0.65

THE BRACHISTOCHRONE PROBLEM SOLVED BY INVARIANT IMBEDDING, DYNAMIC PROGRAMMING AND QUASILINEARIZATION METHODS.
Houston Univ Tex Dept of Mechanical Engineering
For primary bibliographic entry see Field 12A.
AD-669 496 HC$3.00 MF$0.65

NON-LINEAR ORBIT DETERMINATION METHODS.
Heliodyne Corp., Van Nuys, Calif.
A. H. Nayfeh. May 68, 43p NASA-CR-1040
Contract NAS1-6690
Coll- 43 P Refs

Descriptors: *Nonlinearity, *Orbit calculation, *Problem solving, Azimuth, Elevation angle, Error analysis, Numerical analysis, Range (extremes), Range errors, Vector analysis.

For abstract, see STAR 06 12.
N68-21864 HC$3.00 MF$0.65

COMBINED SOLUTION FOR LOW DEGREE LONGITUDE HARMONICS OF GRAVITY FROM 12 TO 24 HOUR SATELLITES.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
C. A. Wagner. Apr 68, 15p NASA-TM-X-63169, X-643-68-131

Descriptors: *Communication satellites, *Gravitational fields, *Harmonics, *Satellite perturbation, *Synchronous satellites, Drift rate, Twenty-four hour orbits.

For abstract, see STAR 06 12.
N68-21920 HC$3.00 MF$0.65

ELDO GUIDANCE STATION.
La Station de Guidage Eldo
Manufacture Belge de Lampes Et de Materiel Electronique, Brussels (Belgium).
H. Vigneron. 1966, 10p
Lang- in French Seri- Its Mble Rev., Vol. Ix, No. 1

Descriptors: *Command guidance, *Eldo launch vehicle, *Ground based control, *Trajectory control, Antennas, Interferometry, Satellite tracking, Signal detection, Transponders.

For abstract, see STAR 06 12.
N68-22036 HC$3.00 MF$0.65

OPTIMAL FINITE-THRUST TRANSFER BETWEEN PLANET APPROACH AND DEPARTURE ASYMPTOTES WITH SPECIFIED INTERMEDIATE ORBIT.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
E. A. Willis, Jr.. Apr 68, 59p NASA-TN-D-4534

Descriptors: *Interplanetary flight, *Optimal control, *Thrust control, *Transfer orbits, Asymptotes, Elliptical orbits, Parking orbits, Planetary orbits, Round trip trajectories.

For abstract, see STAR 06 12.
N68-22096 HC$3.00 MF$0.65

TIME-OPTIMAL RENDEZVOUS FOR ELLIPTIC ORBITS.
Virginia Polytechnic Inst., Blacksburg.
K. T. Alfriend, and Y. Kashiwagi. May 68, 125p NASA-CR-1036
Contract NGR-47-004-006
Coll- 125 P Refs

Descriptors: *Orbital rendezvous, *Rendezvous trajectories, *Spacecraft control, *Time optimal control, Interception, Orbital mechanics, Rendezvous guidance, Trajectory analysis, Variable thrust.

For abstract, see STAR 06 12.
N68-22202 HC$3.00 MF$0.65

SYNTHESIS OF THE ANALYTICAL RESULTS ON OPTIMAL TRANSFER BETWEEN KEPLERIAN ORBITS.
Synthese des Resultats Analytiques Sur les Transferts Optimaux Entre Orbites Kepleriennes
Techtran Corp., Glen Burnie, Md.
C. Marchal, J.-P. Marec, and C. B. Winn. Apr 68, 36p NASA-TT-F-11590
Contract NASW-1695
Coll- 36 P Refs Tran- Transl. Into English of Onera-tp-515 Rept. Conf- Presented At the 18th Congr. of the Intern. Astronautical Federation, Belgrade, 25-29 Sep. 1967

Descriptors: *Numerical analysis, *Orbital mechanics, *Transfer orbits, Optimization, Orbit calculation, Propulsion system performance, Propulsive efficiency, Thrust control, Thrust programming, Trajectory control, Vector analysis.

For abstract, see STAR 06 12.
N68-22247 HC$3.00

SOME NUMERICAL COMPARISONS OF THREE-BODY TRAJECTORIES WITH PATCHED TWO BODY TRAJECTORIES FOR LOW THRUST ROCKETS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
W. C. Strack. May 68, 30p NASA-TN-D-4559
Contract 789-30-01-01-22

Descriptors: *Low thrust propulsion, *Three body problem, *Trajectories, *Two body problem, Approximation, Earth orbits, Many body problem, Numerical analysis, Planetocentric coordinates, Transfer orbits.

For abstract, see STAR 06 12.
N68-22289 HC$3.00 MF$0.65

GRAVITY ASSIST OPTIMIZATION TECHNIQUE APPLICABLE TO A VARIETY OF SPACE MISSIONS.

National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
F. Chromey, B. Kaufman, and C. R. Newman.
Aug 66, 31p NASA-TM-X-63179, X-507-66-373

Descriptors: *Gravitational effects, *Planetary gravitation, *Space missions, *Trajectory optimization, Ecliptic, Jupiter (planet), Perihelions, Space probes, Trajectory analysis.

For abstract, see STAR 06 12.
N68-22922 HC$3.00 MF$0.65

22D. Spacecraft Launch Vehicles and Ground Support

EXPERIMENTAL INVESTIGATION OF THE LONGITUDINAL VIBRATION OF A REPRESENTATIVE LAUNCH VEHICLE WITH SIMULATED PROPELLANTS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
R. R. Clary, and J. A. Schoenster. May 68, 67p NASA-TN-D-4502
Contract 124-08-05-19-23

Descriptors: *Launch vehicle configurations, *Vibration tests, Damping, Liquid rocket propellants, Propellant tanks, Resonant frequencies, Stress analysis, Vibration mode, Vibration simulators.

For abstract, see STAR 06 12.
N68-21869 HC$3.00 MF$0.65

SOME ASPECTS OF ADVANCED PROPULSION SYSTEMS APPLICATIONS.
Quelques Aspects de l'Utilisation des Systemes de Propulsion Avancee
European Space Vehicle Launcher Development Organization, Paris (France). Studies and Exptl. Work Directorate.
J. P. Contzen. Sep 67, 24p ELDO-TM-105
Lang- in French Conf- Presented At the 18th Intern. Congr. of Astronautics, Belgrade, Sep. 1967

Descriptors: *Conferences, *Electric propulsion, *European space programs, *Nuclear propulsion, *Performance prediction, Coaxial plasma accelerators, Colloidal generators, Launchers, Polonium 210, Solar propulsion, Thorium isotopes, Transfer orbits.

For abstract, see STAR 06 12.
N68-21907 HC$3.00 MF$0.65

APOLLO/ SATURN 5 - FLIGHT READINESS TEST.
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 06 12.
N68-21910 HC$3.00

COMPUTATION OF TORSIONAL VIBRATION MODES OF RANGER AND SURVEYOR SPACE VEHICLES.
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
J. A. Garba, W. H. Gayman, and B. Wada. 1 Apr 68, 72p NASA-CR-94293, JPL-TM-33-277
Contract NAS7-100

Descriptors: *Atlas agena launch vehicles, *Atlas centaur launch vehicle, *Free flight, *Mathematical models, *Torsion, Ranger project, Spacecraft control, Surveyor project.

For abstract, see STAR 06 12.
N68-22024 HC$3.00

METHOD FOR DETERMINING NORMAL MODES AND FREQUENCIES OF A LAUNCH VEHICLE UTILIZING ITS COMPONENT NORMAL MODES.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. D. Mc Aleese. May 68, 50p NASA-TN-D-4550
Contract 180-06-06-03-22

Descriptors: *Equations of motion, *Resonant frequencies, Iterative solution, Launch vehicle configurations, Mathematical models, Matrices (mathematics), Vibration mode.

For abstract, see STAR 06 12.
N68-22275 HC$3.00 MF$0.65

AN AIRBORNE PULSE COUNTER AND SERIAL ENCODER.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
For primary bibliographic entry see Field 9F.
For abstract, see STAR 06 12.
N68-22423 HC$3.00 MF$0.65

WIND TUNNEL INVESTIGATION OF FLUCTUATING PRESSURES ON A 1/10-SCALE CENTAUR MODEL AT TRANSONIC SPEEDS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
B. J. Blaha. May 68, 19p NASA-TM-X-1574
Contract 120-03-01-08-22

Descriptors: *Centaur launch vehicle, *Pressure effects, *Transonic speed, *Wind tunnel models, Aerodynamic coefficients. Background noise, Dynamic pressure, Free flow, Supersonic wind tunnels.

For abstract, see STAR 06 12.
N68-22742 HC$3.00 MF$0.65

STATIC LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF SEVERAL CONFIGURATIONS USED IN THE DEVELOPMENT OF THE LITTLE JOE 2- APOLLO TEST VEHICLE AT MACH NUMBERS FROM 0.056 TO 4.65.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
R. H. Moore, Jr.. May 68, 225p NASA-TN-D-4439
Contract 914-50-10-09-72

Descriptors: *Aerodynamic characteristics, *Apollo spacecraft, *Little joe 2 launch vehicle, *Test vehicles, Aerodynamic configurations, Longitudinal stability, Static tests.

For abstract, see STAR 06 12.
N68-22953 HC$3.00 MF$0.65

PLANNING RESEARCH IN THE AREA OF LAUNCH VEHICLE AND PROPULSION PROGRAMS PROGRESS REPORT, 1-31 MAR. 1968.
Battelle Memorial Inst., Columbus, Ohio.
B. W. Davis, D. S. Edgecombe, D. A. Nippert, R. F. Porter, and A. E. Weller. 12 Apr 68, 11p NASA-CR-94397, BMI-NLVP-TPR-68-2
Contract NASW-1146

Descriptors: *Launch vehicle configurations, *Multistage rocket vehicles, *Nasa programs, *Spacecraft reentry, Booster rocket engines, Lunar orbits, Reentry vehicles, Research projects, Spacecraft propulsion.

For abstract, see STAR 06 12.
N68-22992 HC$3.00 MF$0.65

STUDY OF THE CHEMICAL INTEGRITY OF RADIOISOTOPE CONTAINMENT MATERIALS IN LAUNCH ABORT ENVIRONMENTS,
TRW Systems, Redondo Beach, Calif.
W. Gregson. Dec 67, 111p
Contract 48-4912

Descriptors: (*Radioactive isotopes, Containers), (*Launch vehicles (Aerospace), Abort), Power supplies, Spaceborne, Hazards, Stainless steel, Refractory metal alloys, Tantalum, Degradation.

For abstract, see NSA 22 10.
SC-CR-67-2830 HC$3.00 MF$0.65

REPORT LOCATOR LIST

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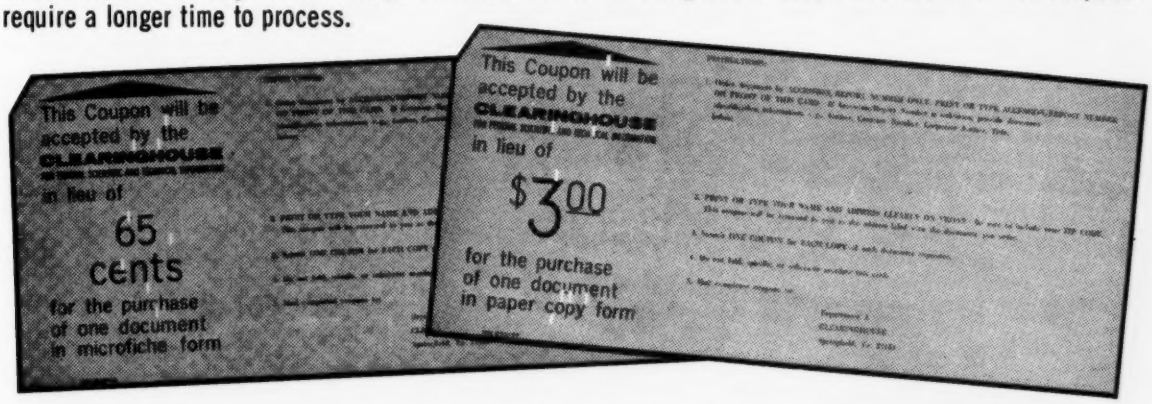
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